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CONTENTS.

Original Communications.

PAGE

The Non-Contagiousness of Pulmonary Tuberculosis. By Thos. J. Mays, M.D. ... 145
Cuneiform Osteotomy for Anterior Curvature of both Tibiæ and both Fibulæ. By Milton Josiah Roberts, M.D. ... 154
Antifebrin. By William Osler, M.D. ... 163
The Physiological Action of the Valerianate of Ammonium on the Nervous System. By Wm. E. Parke, M.D. ... 167
Remarks on the Therapeutic Value of Manaca, Jamaica Dogwood, and Euphorbia Pilulifera, Viburnum Prunifolium. By Allan S. Payne, M.D. ... 171
Meteorology. By A. Comstock, M.D. ... 174
Muriate of Pilocarpine in Uræmia. By A. D. Bundy, M.D. ... 177
Use of the Abdominal Bandage in the Second Stage of Labor. By Cheves Bevill, M.D. ... 177

Leading Articles.

Bromism ... 178
Pathogenetic Therapeutics ... 179
Faith-Cure ... 180
Mineral Springs of the United States ... 180
The Digestive Ferment of Carica Papaya ... 181
An Investigation of Pasteur's Methods. 181
Tree-Planting ... 182
Yellow Fever Investigations ... 183

Reports on Therapeutic Progress.

PAGE

Morphine in Diabetes ... 183
The Antiseptic Treatment of Summer Diarrhœa ... 184
Antifebrin ... 184
The Detection of Cocaine in the Animal Body ... 185
A Speedy Cure of Whooping-Cough ... 185
Gelsemimum Alkaloids ... 186
The Subcutaneous Injection of the Yellow Oxide of Mercury in Syphilis ... 186
A New Method of Sewer-Ventilation ... 186
Antipyrin in Hemicrania ... 187
Hydrastis Canadensis in Uterine Hemorrhage ... 187
Tests for the Purity of Cocaine ... 187
Hyoscine in Kidney-Diseases ... 187
Naphthalin ... 188
Absorption from the Mucous Membrane of the Urinary Bladder ... 188
Pyridin in Asthma and other Dyspnœas. 189
Digitalin ... 189
Cotton-Root as a Uterine Hæmostatic ... 189
Description of Antifebrin ... 190
Researches upon the Digestion of Alcohol ... 192
Diagnosis of Gastric Disease ... 192
The Acids of Healthy and Diseased Stomachs ... 193
Intra-Pulmonary Injections ... 193
The Use of Spleen-Pulp in Anæmia ... 194
An Experimental Research upon Rabies ... 194
An Unusual Case of Acute Intoxication from Morphine ... 194
Rectal Injection of Gases in Diseases of the Lungs ... 195
Lead-Poisoning from Chocolate wrapped in Tin-Foil ... 195
Transplantation of Tendon from Animal to Man ... 196

PAGE

The Therapeutic Value of Tincture of Cannabis Indica in the Treatment of Subacute and Chronic Dysentery ... 196
Persistent Vomiting as a Cause of Ear-Troubles ... 196
Surgical Treatment of Hydatids of the Liver ... 197
Cocaine Cotton ... 199
Treatment of Hæmatoma of the Ear ... 199
Notes on Pyrethrin ... 200
Different Methods of treating Cervical Catarrh ... 200
The Administration of Phosphorus in Rickets ... 200

Reviews ... 201

Correspondence.

Berlin Letter ... 207
Paris Letter ... 209
Chemical Feeding ... 211
Urticaria from Indigestion ... 212
Potassium Bromide in Salivation ... 213

Notes and Queries.

Incompatible Prescriptions ... 213
A New "Cure for Cancer" ... 214
Adonis Vernalis in Heart-Disease ... 214
Hysterogenic Zones on the Mucous Membranes of Hysterical Subjects ... 215
Stomach Digestion ... 215
The Cure of Hydrocele by Corrosive Sublimate ... 215
Treatment of Cerebral Pneumonia ... 216
The Digestion of Milk ... 216
To stop Toothache ... 216
Prescription for Headache ... 216
Prescription for Psoriasis ... 216

Original Communications.

*THE NON-CONTAGIOUSNESS OF PULMONARY TUBERCULOSIS.**

By Thos. J. Mays, M.D., Philadelphia, Pa.

We are probably safe in asserting that the majority of the members of the medical profession are impressed with the belief that pulmonary consumption is a contagious disease. If this current opinion is true, it becomes one of the gravest questions, both in domestic and public hygiene, to define the proper relation between the consumptive patient and his surroundings. Therefore, fully appreciating the difficulties which envelop this problem, and holding the highest regard for the intelligent minds with whom we are compelled to take issue, we shall offer no other apology than the importance of the subject for making it the topic of this paper; with the express avowal, however, that this is not undertaken for the mere purpose of entering the arena of controversy, but from a conviction that the belief in the contagiousness of the disease is erroneous, and with a sincere desire to add something which, perchance, may be of value in placing this much-disputed question on a more solid basis than it has heretofore occupied.

Viewed from the broad stand-point of evo-

* Read before the Philadelphia County Medical Society February 23, 1887.

lution, as this question naturally must be, it will appear that all the infectious diseases are the result of a living union and interaction of unlike though not too highly specialized cells; or, to be more specific, these diseases are the products of grafting one cell on another,—a process identical with that of grafting practised in the vegetable world, and with skin-grafting frequently resorted to in the human subject,—and their intensity depends on the activity of the reproductive power with which these cells are endowed. This reproductiveness is common to every living cell in the animal body, but varies widely in different cells, being most active in those which are least differentiated, or, in other words, in those which retain the nearest approach to the original cell-type. In the lower stages of life all the cells in an organism are equally endowed with the power of reproduction, and any indifferent segment is capable of reproducing the whole animal. Thus, protozoa multiply by spontaneous fission, and the original organism resolves into a number of new individuals like the parent. But in the evolutionary changes of animal life the cells of some tissues undergo a greater modification than those of others, and those which diverge most from the original type become the least reproductive, while those which undergo no, or very little, change remain the most reproductive. In this higher stage of life the process of reproduction is carried on by a specialized tissue,—the ovary and testis,—the cells of which only retain the power of reproducing the whole animal, while in the cells of the other tissues, although they are still capable of reproducing themselves, this power is lost. The form-elements of the body consist of epithelial tissues, tissues of the connective substance, the muscular, and nervous tissues, and of all these the nervous tissue has the highest and the epithelial tissue the lowest organization. Gegenbaur says that epithelium represents both phylogenetically and ontogenetically the oldest and most primitive form of cellular tissue.

Now, reproduction itself is generally regarded as a very complicated process, and one for the performance of which highly specialized organs are considered essential; but on examination it will be found that both the sperm-cell and the germ-cell originate in the epithelial layer, which, as we have seen, is the simplest and most unspecialized tissue in the body. Hence, from a biological point of view, it is an extremely simple process. In relation to this subject Herbert Spencer ("Biology," vol. i. p. 220) says, "The organs for preparing sperm-cells and germ-cells have none of the specialty of structure which might be looked for did sperm-cells and germ-cells need endowing with properties essentially unlike those of all other organic agents. On the contrary, these reproductive centres proceed from tissues that are characterized by their low organization. In plants, for example, it is not appendages that have acquired considerable structure which produce the fructifying particles: these arise at the extremities of the axes, where the degree of structure is the least. The embryo-cells are formed in the undifferentiated part of the cambium layer; the pollen-grains are found at the little-differentiated extremities of the stamens, and both are homologous with simple epithelium-cells. Among many inferior animals, devoid of special reproductive organs, such as the *hydra*, the ova and spermatozoa originate in the layer of indifferent tissue that lies between the endoderm and the ectoderm,—that is, they consist of portions of the least specialized substance. And in the higher animals these same generative agents appear to be merely modified epithelium-cells,—cells not remarkable for their complexity of structure, but rather for their simplicity."

But this is not all that concerns us here; for, in accordance with a well-known physiological law, organic cells manifest an elective affinity for one another during the process of fertilization, which is weakest when the sperm-cell and the germ-cell possess too much sameness, and strongest when these cells originate from the same tissue in different individuals of the same species. This is well shown in the vegetable world. Nearly all plants are hermaphrodites,—that is, they are so situated that it is possible for the ovules of each flower to be fertilized by pollen from the same flower; yet practically this does not occur, for Mr. Darwin has demonstrated that either the ovules and pollen of the same plant do not ripen simultaneously, or that other obstacles arise which prevent fertilization in this direct way, and that the most vigorous vegetation is produced when fertilization takes place between different plants. The same law of cell affinity also exists in the highest organisms.

That which is of the greatest interest to us at present in these biological phenomena is (*a*) that the cells of every tissue in the animal body possess the power of reproducing themselves; (*b*) that the power of reproducing the whole individual is shared only by the cells of the epithelial tissue; and (*c*) that the process

of reproduction is most active between the slightly differentiated cells of the same tissue not in the same, but in different individuals. And we shall find that these deductions are as applicable to pathological as they are to physiological processes, for disease is propagated in the same manner as health is.

When under proper conditions a germ which has been modified by disease is grafted on a healthy germ, disease-germs will be produced, and the number of disease-germs thus produced will depend on the facility with which both germs reproduce themselves; and from what has been said it is evident that disease-germs will be most abundant when the epithelial tissues are involved, and least abundant when they originate in the nervous or muscular tissues, while those coming from the white or connective tissues occupy an intermediate position in this respect.

We have now arrived at a point where we are enabled to define the term contagion. Broadly, it may be stated that all infectious diseases are either contagious or inoculable, and that both of the latter terms represent processes which differ in degree only and not in kind. It is essential to both that their respective germs should find lodgment in the circulation before the disease is transmitted from one individual to another, and whether a germ is contagious or not depends on the facility with which it gains admission to and multiplies itself in the tissues for which it has an affinity; or, in other words, if a germ has the power of entering the circulation through the coverings of the body, it is a contagious germ; but when this is not the case, and it must be introduced by means of artificial force, then the germ is not contagious, but inoculable. Now, the facility with which a germ enters the blood is in a great measure owing to its reproductive activity outside of the blood. A germ which rapidly multiplies, and which disseminates a great number of contagious germs throughout the atmosphere, will expose the recipient body to a greater number of such germs in a given time, and hence will be more communicable than that germ which is devoid of these properties, or possesses them in a less degree. That the numerical element plays a very important part in the process of contagion and of inoculation is very evident from the examples which Darwin gives us in illustration of the analogous process of sexual genesis. He says,* "This view of the importance of the quantity of formative matter seems probable from the following considerations: There is no reason to suspect that the spermatozoa or pollen-grains of the same individual animal or plant differ from each other; yet Quatrefages has shown in the case of the Teredo, as did formerly Prevost and Dumas with other animals, that more than one spermatozoon is requisite to fertilize an ovule. This has likewise been clearly proved by Newport, who adds the important fact, established by numerous experiments, that, when a very small number of spermatozoa are applied to the ova of Batrachians, they are only partially impregnated, and the embryo is never fully developed. The first step, however, towards development, namely, the partial segmentation of the yelk, does occur to a greater or less extent, but is never completed up to granulation. The rate of the segmentation is likewise determined by the number of the spermatozoa. With respect to plants, nearly the same results were obtained by Köreuter and Gartner. This last observer found that even thirty grains did not fertilize a single seed; but when forty grains were applied to the stigma, a few seeds of small size were formed. Naudin made the following interesting experiments: A flower was fertilized by three grains, and succeeded perfectly; twelve flowers were fertilized by two grains, and seventeen flowers by a single grain, and of these one flower alone in each lot perfected its seed, and it deserves especial notice that the plants produced by these two seeds never attained their proper dimensions, and bore flowers of remarkably small size."

Taking into consideration, then, what has been said concerning the fertility of the epithelial tissues and the comparative infertility of the other tissues, it will be obvious on *a priori* grounds that those diseases which are located in the former are contagious only, while those lodged in the latter are inoculable but not contagious; and we shall see with what remarkable uniformity this induction obtains among the infectious diseases when they are classified in accordance with this idea. Thus, the principal infectious diseases of the epithelial tissues are—

Smallpox, Cow-pox, Measles, Scarlatina, Diphtheria, Typhoid fever, Gonorrhœa, Erysipelas.	First group.

* Animals and Plants under Domestication, vol. ii. pages 435 and 436.

Those of the connective tissues are—

Sarcoma,
Carcinoma, (?)
Tubercle,
Syphilis.
} Second group.

It will be observed that the contagiousness of the first group of the infectious diseases as above given is directly related to the severity of the cutaneous eruption; and this is a practical confirmation of the above-made deduction that the degree of contagiousness is due to the number of contagium particles thrown off from the skin and diffused throughout the atmosphere. Smallpox produces the most extensive as well as the most intensive disturbance in the skin of any of the eruptive fevers, in all probability emits the greatest number of germs, and is admittedly the most contagious. Next in order of contagiousness comes measles, the cutaneous disturbance of which is no more marked than that of scarlatina; and yet it is said to be more contagious, because the eruption of measles is chiefly confined to the skin, while the most intense lesions of scarlatina are concentrated in the throat, from whence the contagium particles are less readily diffused than they are from the free external surface of the body. Then, again, it is a well-known fact that in many cases of measles the cuticle is cast off in a finer state of division than it is in scarlatina, and this of itself renders the epithelial germ of the former disease more diffusible. Owing to the violence of the process of diphtheria, this disease, although not accompanied by any well-defined skin-affection, ranks next to scarlatina in point of contagiousness.

In regard to the contagiousness of typhoid fever, in the sense in which the former term is used here, there can be but one opinion, but for the reason which has already been given, viz., that diseases of the internal surfaces are less contagious than those of the external surfaces, its contagious influence is rather limited. Occasionally, however, in cases where the dejecta are unduly exposed to a dry and warm atmosphere, or where they are confined in an improperly ventilated cesspool, the contagium particles diffuse so rapidly in the first instance, and accumulate and enter dwellings through drainage-pipes in such quantities in the second, that they become an undoubted source of contagion.

Gonorrhœa is the only one of the infectious diseases of the epithelial tissues in the above list which is not contagious; due, undoubtedly, to the fact that only a small surface area is involved, and that the lesion is confined to a tubal cavity with a narrow opening on the outside, all of which forbid a multiplication and dissemination of germs in sufficient quantity to give rise to the danger of infection through contagion.

Erysipelas is essentially a skin-disease, and, as a rule, is non-contagious. Generally it is limited to a comparatively small area, and hence is not so liable to contaminate the surrounding atmosphere, and so become contagious; yet when the disease involves a large extent of surface, and at the same time exists in an aggravated form, or becomes epidemic, it certainly throws off a sufficient number of gemmules to become contagious, as is well attested by many clinical facts.

From what has already been said it follows that the infectious diseases of the second group cannot be contagious, because they are principally located beneath the cutaneous and mucous surfaces of the body. It is well ascertained that, with the probable exception of carcinoma, all of them originate from or inhabit the connective tissue. Thus sarcoma and syphilis invade the subcutaneous, the submucous, or subserous fibrous tissue, or the connective tissue of other organs; while tubercle infects the lymphatic system, which is but a modified form of the same tissue. There can be no doubt that the stroma of cancer is of connective-tissue origin, but whether its cells come from the same source, or are of epithelial origin, is a disputed point among our best histologists. This is immaterial so far as the question is here concerned, for these growths, like those of sarcoma, syphilis, and tubercle, are almost exclusively confined below the bodily surfaces, and hence have not sufficient communication with the atmosphere to become contagious. All these diseases are, however, infectious, for they have been communicated by means of inoculation. They all manifest a strong tendency towards auto-infection,—*i.e.*, the original cells multiply and distribute their germs throughout the body by means of the blood and lymphatic circulation. In this manner sarcoma and carcinoma disseminate themselves and become very malignant in their course, the rapidity of the dissemination depending somewhat on the softness or succulency of the original growth. In the same way syphilis and tubercle are capable of contaminating the white or connective tissue of the principal organs of the body from one infectious centre.

Thus when the infectious diseases are

viewed from a biological stand-point we find that they naturally divide themselves into two classes,—viz., the contagious diseases, or those which are readily communicated; and the non-contagious or inoculable diseases, or those which are not readily communicated. If, in consonance with this idea, the same method of reasoning were carried further, it could also be shown that growths occurring in muscle and nerve, which are the most highly differentiated tissues in the body, possess no infectious or communicable property whatever; but we think that from this side of the question enough evidence has been brought forward to show that pulmonary tuberculosis both from its nature and relation is entirely devoid of contagion, and that it is no more communicable than cancer, syphilis, or any of the diseases with which it has the closest histological affinity.

After having said this much on the deductive side of the non-contagious nature of pulmonary tuberculosis, we will endeavor to ascertain the trend of the evidence on its inductive side. This evidence divides itself naturally into that which has been gleaned from experiment, and into that which has been derived from clinical experience. The first consists in inoculating and feeding animals with, and compelling them to inhale, tuberculous material; and the second consists in tracing the influence which tuberculous patients exert on their living surroundings through ordinary intercourse.

In regard to the experimental evidence, it may as a general rule be stated that artificial tuberculosis can be induced in the lower animals most readily by inoculation and least readily by feeding the poison, notwithstanding the facts that in numerous instances negative results are obtained by any method of introducing it; that many animals, like rabbits, guinea-pigs, etc., are more susceptible to its action than dogs, cats, etc.; and that it seems to be more communicable when introduced into the abdominal cavity than in the eyeball. The successful genesis of tubercle in this artificial way is, however, no more than one would be led to expect from a knowledge of its nature and of that of many kindred poisons, and is not the least evidence that they possess any contagious property; for abscess, gonorrhœa, malaria, etc., are communicated in the same manner, yet no one thinks of ascribing the power of contagion to these diseases.

While, then, there is no doubt as to the inoculability of pulmonary tubercle, it remains to be proven whether this disease is ever transmitted between man and man, or between man and animals through atmospheric contagion. For obvious reasons clinical evidence is the only umpire to which we can appeal for a solution of this part of the question, and in order to bring this clearly into view we shall endeavor to compare the salient characteristics of those diseases, which are undoubtedly contagious, with those of pulmonary tuberculosis.

Exposure.—As a rule those who are most exposed to a contagious disease are most liable to it, while the opposite is true of pulmonary tuberculosis. Do the practitioners of medicine, and especially those who believe in the contagiousness of the disease, take the proper precautions against infection in this manner, or do their actions fail to confirm their professions? On this point Professor Lichtheim expressed himself in no uncertain tones before the Second Medical Congress of Germany, which met in Wiesbaden in 1883. Among other things he said that it must be admitted that there are many facts which contradict the contagious nature of pulmonary phthisis. Intercourse with consumptive people is not attended with danger. We hospital physicians spend much time among such people, and we have such confidence in the innocuousness of the disease that we do not hesitate to mix healthy persons with them in institutions devoted to its treatment, and we must confess that this procedure is practically unattended by any unfavorable results. He further stated that the mortality of the attendants in the principal hospitals for consumption was surprisingly low; and that he could, from investigation, confirm the belief that there is no relation between the increase of the number of phthisical patients at a health resort and the number of deaths from consumption occurring among the native inhabitants.

The statistics of the Brompton Hospital for Consumption in London, as collected by Drs. Williams and Humphreys, speak in the same emphatic manner against the contagiousness of pulmonary tuberculosis. This large institution shows that during a period of thirty-six years not a single clearly authenticated case of pulmonary consumption among all its attachés emanated from within its walls. During the thirty-six years there were twenty-nine physicians and assistant physicians connected with the hospital, and among these occurred a single case of phthisis, and he was tuberculous before he entered it. The rest were all well. Dr. Edwards was resident for

twenty-six years, yet he showed no sign of the disease. During that period there were employed one hundred and fifty clinical assistants. Of these eight died of consumption; but all, except one, were sufferers from the disease before they became connected with it, and in this one case there is doubt as to the origin of the trouble. Among the one hundred and one nurses, of which there is a health record, one is suffering from a slow form of the disease, which may have been contracted during her service at the hospital, although she is predisposed to consumption. She is an old employé, and able to attend to her duties efficiently most of her time. No more positive proof of the non-contagiousness of pulmonary phthisis could be gathered anywhere than is furnished by this large institution. Every one of the individuals associated with this hospital were almost constantly exposed to the disease, and still there is only a single case to which the least claim of contagion could be made, and this rests largely on suspicion.

These statistics in regard to the non-contagiousness of phthisis are strikingly confirmed by those which relate to the influence of the Consumption Hospital of Görbersdorf, in Germany, on the death-rate from phthisis among the inhabitants of that town. Dr. Brehmer, who has been in charge of that institution for twenty years,* says that since the year 1854 more than ten thousand consumptives resided in the Görbersdorf hospital, who walked the streets of the town daily and commingled with its inhabitants. The latter were, therefore, constantly respiring an atmosphere more or less laden with tubercle-bacilli emanating from the dried expectorations of these consumptive visitors; yet, in spite of these favorable conditions for contagion, the mortality statistics of the town show that prior to 1854 there were 10.07 annual deaths from consumption among its inhabitants, while from 1854 to 1880 there were only 5.0 deaths per year, or a death-rate somewhat less than one-half of what it was before the introduction of the hospital. These figures are especially interesting in view of the assertions frequently made that the healthful influence of mountain resorts is impaired by the infectiousness of the exhalations and expectorations coming from consumptive people who go there for the purpose of seeking relief, showing that such suspicions are more imaginary than well founded.

* Die Aetiologie der Chronischen Lungenschwindsucht, p. 18.

Then, again, it is common to find physicians, both in this country and in Europe, who are sufferers from consumption, and therefore compelled to spend most of their lives in the mountain resorts of their native countries, to labor hard among their many fellow-sufferers who constantly crowd these places, and yet they experience no inconvenience from their contact with these people, but, on the other hand, regain exceptionally good health.

Once more, not very long ago, Dr. J. Solis-Cohen, who has since become our honored President, said before this society that if any class of medical practitioners is more exposed to the virus of tubercle than another it is certainly the class to which he belongs, viz., the laryngologists. They are constantly operating on patients with tubercular ulceration of the throat, inhaling their breath and often their cough, and are continuously exposed to the evaporation of the sputum in the cuspadores of their offices, yet he was unaware of a solitary instance of infection brought about in this way.

Contagion between Husband and Wife.—In 1883 a committee, appointed by the British Medical Association, investigated the contagiousness of pulmonary phthisis by sending a printed circular asking the members of the profession throughout England whether they had observed any cases in which the disease was believed to have been communicated. The committee received ten hundred and seventy-eight answers. Of these, seven hundred and seventy-eight were negative, thirty-nine were doubtful, and two hundred and sixty-one were affirmative. Of the affirmative answers, one hundred and fifty-eight were cases where the communication of the disease was supposed to have taken place between husband and wife, or *vice versa*, eighty-one between members of the same family, and the remainder were principally cases between whom there was no blood connection.

On account of the large number of affirmative opinions, this report has been made to subserve the interests of those who believe in the contagiousness of phthisis. Evidently this is unfair, since the aim of the investigation was not to ascertain the number of absolutely well-demonstrated cases in which contagion was present or absent, for this would obviously have been next to an impossibility, but to collect the individual opinions of a large number of physicians as to whether they believed the disease contagious or not, and this resulted in seven hundred and seventy-

eight negative, and two hundred and sixty-one affirmative votes. Are we, therefore, justified in assuming that the two hundred and sixty-one opinions are of more weight than the seven hundred and seventy-eight negative ones, and thereby imply that the former only had the fortune or the misfortune to meet cases which originated through contagion, and that the latter had not? Is it not more probable that all of them witnessed cases around which hung a cloud of suspicion that they might be contagious, but that seven hundred and seventy-eight did not consider the proof strong enough to outweigh that which in their minds was in favor of other and more powerful influences in the production of the disease? Evidence of infection between married people is, we believe, much less common than it is generally believed to be. In our whole personal experience we can only recall a single instance where the wife may have contracted it in this way, although even in this case there is an incomplete family record, and the patient herself was a dressmaker and in all probability was predisposed to the disease. But were the fact of its communication established in any given case, it would still devolve upon the contagionists to prove that the virus was not introduced under very unusual conditions,—such as being inoculated through an abrasion of the skin or mucous membrane by intimate contact of one person with another.

As still further proof of the correctness of our view concerning the non-contagiousness of phthisis between husband and wife, we beg to call attention to a most admirable paper, entitled "Eine Statistische Studie als Beitrag zur Aetiologie der Lungenschwindsucht," contributed by Dr. Schnyder to Nos. 10, 11, and 12 of the *Correspondenzblatt für Schweizer Aertzte* for 1886. This contribution is based on three thousand four hundred and sixty-one cases of pulmonary phthisis, which were observed by its author while resident physician at the health resort of Weissenburg, in Germany. Of these cases, eight hundred and forty-four occurred among married people, but in four hundred and forty-five of them it was the husband only, and in three hundred and sixty-seven instances it was the wife only, while in thirty-two cases both husband and wife were affected. Now, it must be admitted by the most ardent contagionist that here existed the most favorable conditions for a propagation of the disease between husband and wife, or *vice versa*, through contagion; and the fact that eight hundred and twelve of these cases escaped even a suspicion of contagion, shows clearly that the disease is not by any means readily communicated under extraordinary circumstances. But is it beyond doubt that the thirty-two cases originated through contagion? We think not, for, as Dr. Schnyder says, it is a notorious fact that, in spite of all entreaties and warnings, young people are often wedded while suffering from active lung-disease. He relates four such cases in his own experience in which both the bride and bridegroom came to Weissenburg, fresh from the matrimonial altar, to be treated for phthisis, from which they both suffered. But even letting those who are wedded while suffering from active phthisis out of the question, it cannot be denied that many young people of both sexes carry the hereditary taint of the disease in their constitution, which only awakes from its slumbering condition to assert its power when the many varied burdens and demands of family life begin to exhaust the vital resources.

Moreover, we have recently shown* that consumption makes its appearance in families which are perfectly free from all evidence of the disease. Proof based on two hundred cases of phthisis was there given, that the youngest members of families, provided either or both parents were the youngest members of their respective families, are especially predisposed to this disease. In view of this fact, it is of great importance to scrutinize the family record well before we jump at the conclusion that the disease must have been derived through contagion in the absence of a phthisical family history.

On the point of communicability between husband and wife, the late Dr. Flint, in his work "On Phthisis" (p. 420), says, "In my collection of cases (670), these five are all that I find in which there is room for the suspicion of the disease having been communicated from the husband to the wife, or the wife to the husband. By making inquiries of members of the medical profession, and searching periodicals, doubtless a considerable number of similar cases might be obtained. Collected in this way, however, they would not prove communicability. According to the law of chances, a disease of such frequent occurrence as phthisis would affect in succession a husband and wife, or *vice versa*, in a certain proportion of cases. Conceding

* "Some of the Causes of Pulmonary Consumption, viewed from a Darwinian Stand-point," *Medical News*, November 27, 1886.

that the histories of some of my cases are defective in information on this point, it is certain that the instances in which transmissibility may be suspected are not sufficient in number to be not allowed for as coincidences. It must, therefore, be concluded that the analysis of my cases does not furnish facts sufficient to render the communicability of phthisis probable."

Again, it is a well-known fact that phthisis may originate independently from a caseation centre located anywhere in the body outside of the lungs. Thus enlarged lymphatic glands of the neck, which so frequently follow dentition, or catarrhal affections of the mouth, may caseate at some inopportune time, and generate the specific virus which produces tubercle. Such glands are a standing menace to their possessor, and we have no doubt that they are the cause of at least some of the occult cases of tubercular phthisis. We have no doubt that pulmonary tuberculosis can arise from other infection centres in the body. Thus pyosalpinx, about which we have learned so much recently from Dr. Joseph Price, and from other members of this society, quite often goes on to caseation, and is said to be frequently accompanied, and probably followed, by tubercular involvement of the lung. How many such infection sources may originate spontaneously in the body as the legitimate product of ordinary catarrhal inflammation?

Infectiousness of the tubercle-bacilli, or tubercle-virus, diffused throughout the atmosphere.—In the deductive or biological part of this paper we have given sufficient reason to show that one of the essential requirements in a contagious disease is the property of contaminating the surrounding atmosphere with an abundant crop of disease-germs. We also endeavored to give proof from this standpoint of the question that this is true of smallpox, and of all the active diseases of the external surface of the body, and that it is not true of sarcoma, tubercle, syphilis, or of any of the internal diseases of the body. We shall now inquire whether this harmonizes with the inductive or experimental evidence which can be collected on this point.

Ever since it has been believed that the specific virus of tubercle resides in the bacilli, efforts have been repeatedly made to demonstrate the presence of these organisms in the atmosphere; and while it is claimed that they are always present, they have at no time been shown to exist in sufficient quantities to give rise to the danger of infection.

Baumgarten,* to whom belongs the credit of being a co-discoverer of the bacillus tuberculosis, and who implicitly believes that this organism is the causative agent of pulmonary phthisis, says that he never knew of a single well-established case of phthisis which was acquired through respiring an atmosphere vitiated by the exhalation of consumptive people. And he further says that during the last ten years he made and had made in the Pathological Institute at Königsberg a large number of inoculation experiments on rabbits with tuberculous material, constantly keeping inoculated animals in the same cage with the non-inoculated, the latter thus being exposed to an atmosphere infected with bacilli; yet in no single instance was the tubercular poison conveyed from the inoculated to the non-inoculated animal.

Referring to the work of the two Italian experimenters, Celli and Guarnieri, who undertook to decide whether and under what circumstances a tuberculous person is liable to infect the surrounding atmosphere, Baumgarten describes the three series of experiments which these scientists made. In the first series they placed three ventilating devices, the inner surfaces of which were well covered with Koch's culture gelatin, at different elevations in the chamber of a consumptive patient. The air of the room was strained through these instruments for twelve nights in succession. Part of the gelatin at the end of this time was examined microscopically, and part was inoculated into the eye, the peritoneal cavity, and into the subcutaneous connective tissue of rabbits and of guinea-pigs.

The second series consisted in allowing a number of phthisical patients to respire for a long time into a reservoir which was well coated with Koch's culture gelatin, after which the gelatin was examined microscopically and inoculated into the eye, peritoneal cavity, and subcutaneous connective tissue of rabbits and of guinea-pigs.

In the third series they experimented with air which was aspirated through tubes containing tubercular sputum. The sputum was evaporated by heat, and the air thus exposed was forced through a tube containing sterilized blood-serum and Koch's gelatin. The experiments were continued for many hours, and in many instances were repeated. The culture media were then tested in the same manner as in the two former series,—viz.,

* *Berliner Klinische Wochenschrift*, 1884, p. 626.

by microscopic examination and by inoculation.

Every one of these experiments was followed by negative results. In no case did the microscope reveal a bacillus, nor was tuberculosis produced in any of the animals which were inoculated. Bollinger repeated the work of these two investigators on a vast scale, and confirmed their results in every particular. Tappeiner also imprisoned two rabbits in a closed cage, and allowed a tuberculous patient to cough into the cage. At the end of two months the animals were found to be free from all taint of tubercle.

The results of these researches are all the more astonishing when the fact that in every instance the atmosphere was thoroughly exposed to the sources of tubercular contamination is taken in connection with the other fact that both rabbits and guinea-pigs are intensely susceptible to the tubercular poison. Surely the atmosphere here, if anywhere, must have contained tubercle-bacilli, and if not in number sufficient to produce infection, even when inoculated, how can infection possibly occur under ordinary atmospheric conditions?

Unequal Distribution.—The non-contagious nature of pulmonary tuberculosis is also strikingly manifested when it is compared in point of distribution with well-known contagious diseases. The invasion of a disease like smallpox, for example, implies an epidemic, and a rapid exhaustion of the soil on which it thrives, after which it quickly declines. Its death-rate, no matter how large or how small, is never constant, but rises to a maximum one year and falls to a minimum the next, and then nearly or entirely disappears for a number of years, only to reappear and to re-exhaust the soil which has matured during its absence. But pulmonary tuberculosis never becomes epidemic, and has no soil to exhaust through contagion, unless it is the soil of human life. Its death-rate is so uniform from year to year that it becomes dolefully monotonous. During the last four years of which we have a record the number of deaths in the city of Philadelphia were nearly the same for each year, being 2809 in 1882, 2798 in 1883, 2801 in 1884, and 2821 in 1885; while, on the other hand, there were 1336 deaths from smallpox in 1881, and only 3 in 1885. It is thus seen that the course of a contagious disease is erratic, and that of pulmonary tuberculosis is so constant that a knowledge of its past enables us to foretell its mortality in the near future.

Then, again, if pulmonary tuberculosis is contagious, why are we able to predict with a great degree of certainty that the badly-nourished; those who are overworked, confined in-doors with sedentary employment; those who are overcrowded, or exposed to dampness; those who belong to a heterogeneous population; those who spend long terms in prisons; those who have weak circulatory organs; or those who are the youngest members of numerous families, are, if other things are equal, most prone to die of it? Has ever a contagious disease been more fastidious in the selection of its victims?

Or, again, can contagion account for the fact, which Dr. Schnyder has so well shown in the article already quoted, that while in proportion to the male sex there are more females in German cities than in the country, yet 7.21 per cent. more females suffer from the disease in the country than in the city? Will any one be bold enough to pervert reason and say that the purer air of the country contains more bacilli or contagium germs than the city air? or will he, with Dr. Schnyder, believe that the greater liability of the females in the country is due to the fact that they are greatly more exposed to overwork and to all kinds of weather and temperature than their city sisters?

Quarantine.—If any further evidence were needed to prove that pulmonary tuberculosis is not spread by contagion, it could be found in the fact that the most rigorous quarantining and isolation of tuberculous patients has not the slightest influence in modifying the fatality of the disease, as is attested by the following history: In the year 1782* the authorities of the city of Naples decided that pulmonary tuberculosis was contagious, and logically enforced the most stringent preventive laws imaginable. Every practitioner of medicine was compelled to report every case of pulmonary phthisis immediately after discovery. Neglect of this duty exposed him to a fine of three hundred ducats, and the second offence was followed by imprisonment. Indigent patients were placed in a hospital at once. Their clothing and all their belongings were carefully isolated, and an accurate record kept of them. The punishment for non-compliance with this law was imprisonment. All furniture exposed to infection was ordered to be burned. After the patient's death or restoration his room was thoroughly renovated,—

* Uffelmann, *Berlin. Klin. Wochenschrift*, 1883, No. 24; cited after Brehmer.

the floor, doors, and windows were taken out and burned, and new ones substituted. A heavy fine was imposed on those who bought or sold clothing which was exposed.

This law was in full force up to the year 1848,—for a period of sixty-six years,—and yet during that time there appears no evidence to show its practical usefulness; but, on the other hand, Dr. Rienzi says "that the injury which it inflicted on the city of Naples is simply indescribable." Patients and their friends became objects of execration; houses in which a death occurred from the disease depreciated in value, and their owners became impoverished. A similar law existed in Portugal for many years, and was followed by like disastrous results.

In summing up the evidence which has been adduced in these pages, it appears from the first portion that nearly all the organic diseases of the human body are infectious, but that some, on account of the facility with which their germs multiply and diffuse through the atmosphere, are very readily communicated, while others, which possess these properties in a small degree only, are not readily communicated. The former we have called the contagious, and the latter the non-contagious diseases. Continuing this line of reasoning, we saw that pulmonary tuberculosis clearly belongs to the second or non-contagious class of diseases. In the second or clinical portion we found corroborative evidence of the first portion. Here the danger of exposure; the intimacy between husband and wife; the tubercle-bacilli, or the tubercular virus in the atmosphere; the distribution of the disease; the effects of quarantine; were all discussed in the light of contagion, and nothing was discovered to show the slightest danger of communicating this disease from one person to another under ordinary conditions.

In conclusion, we trust that altogether we have offered sufficient proof for believing that pulmonary tuberculosis is entirely due to influences other than those which are swayed by evil genii residing in the air; and hope that we have succeeded in allaying the morbid fear and the abomination with which consumptive people have recently come to be regarded by the medical profession, by their friends, and by all with whom they come in contact.

1716 CHESTNUT STREET.

CUNEIFORM OSTEOTOMY FOR ANTERIOR CURVATURE OF BOTH TIBIÆ AND BOTH FIBULÆ:

ILLUSTRATING THE GREAT PRACTICAL VALUE OF THE ELECTRO-OSTEOTOME AS A BONE-CUTTING INSTRUMENT, AND THE SPHENOMETER AS AN INSTRUMENT OF PRECISION IN BONE SURGERY — SUTURING OF THE BONES WITH KANGAROO TENDONS—HYDRONAPHTHOLIZED SURGICAL DRESSINGS—BRUCE'S BOW-LEG BRACE.*

BY MILTON JOSIAH ROBERTS, M.D.†

GENTLEMEN:—The patient whom I present to you to-day is a colored boy 4 years of age. He has been brought to this clinic from Newburgh-on-the-Hudson, a distance of some sixty miles. He is the youngest of a family of seven children, five of whom are living. He has a rachitic history. He was two and a half years old before he began to walk, and he has such an aggravated deformity that he has never been able to walk with any degree of comfort.

As I have not previously had an opportunity of getting a photograph of this patient, I have brought with me my camera, together with some dry plates, that I may make a pictorial record of his deformity. (The patient was at once placed in a sitting posture on a small table covered with a white sheet. The nurse stood at the farther side of the table, and held up a white sheet, which served as a background. Prof. Roberts quickly placed his camera in position, focused the image of the patient on the ground glass, put a plate-holder in position, and exposed one of the sensatized plates, occupying in all not more than a minute and a half of time. The negative was subsequently developed, and Fig. 1 was made from it.—REPORTER.)

I think it is of the greatest possible importance, in making records of examples of deformity, to have photographs which illustrate them. They give the best idea of the deformity in the shortest space of time, and as evidence of the existence and extent of a deformity will usually rank higher than almost any other form of record.

Now for the geometrical observations which

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* A Clinical Lecture delivered at the New York Post-Graduate Medical School and Hospital, October 19, 1886.

† Professor of Orthopædic Surgery and Mechanical Therapeutics, Visiting Orthopædic Surgeon to the City Hospital on Randall's Island, Consulting Orthopædic Surgeon to the Woman's Hospital, Brooklyn, etc. Phonographically reported by J. J. Sullivan, M.D.

FIG. 1.

Negro, showing deformity.

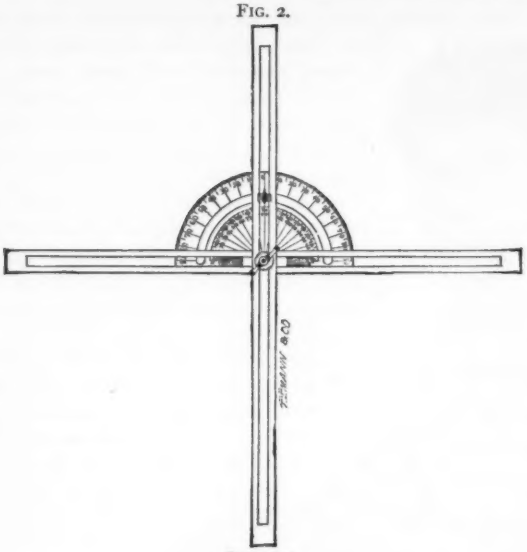
should always be made in cases of this kind.* While a photograph representing the deformity is of great service in giving a general idea of the extent of aberration, it does not furnish us with all the desired information, and, even if it did, the expense of reproducing photographs in the form of cuts is so great that it cannot always be borne by those who have cases to report. It is desirable, therefore, to have an additional record of the degree of deformity, which record shall be in terms that are intelligible to those who may seek information from its perusal. To this end it is necessary to employ an instrument of precision. The instrument which, in my judgment, is best adapted to determine the extent of aberration in degrees, in examples of deformity of this kind, is a protractor, which I have had constructed for this special purpose. This protractor (Fig. 2) is furnished with two sets of graduations, and three series of figures marked on the face of the semicircle. Both arms of the instrument are made adjustable. One of these arms slides in a groove, which passes through the base of the graduated semicircle. In using the instrument this arm is placed so as to correspond to what should be the normal plane of that part of the body which is the subject of observation. The other arm is secured in a revolving headpiece, so that one of its edges corresponds to or passes through the centre of the base of the graduated semicircle. This arm can be rotated so as to correspond with the plane of the deformity, and the number of degrees of aberration is then read off from the graduated circle. Proceeding to measure the deformity in this case, in the manner I have described, we find the extent of the anterior curvature of the bones of the right leg is forty-five degrees, and of the left leg forty-three degrees. A little farther on you will see that these observations not only serve as a useful record of the extent of deformity, but will be indispensable to the employment of another mathematical instrument to be used in determining the dimensions of the base of the wedges to be removed to correct the anterior deformity of the tibiæ and fibulæ.

The bone-cutting instrument which I will use in performing the operation for the correction of this deformity is one that has been devised and elaborated by myself, and which I have called the electro-osteotome.† (See

* "Anatomical Geometry and Toponymy. An Introduction to the Scientific Study of Deformities, with a Description of New Mathematical Instruments." Read before the Medical Society of the State of New York, February 3, 1885; *The Medical Record*, February 21, 1885.

† "Description and Practical Demonstration of the Working of Roberts's Improved Electro-Osteotome, New

FIG. 2.



Protractor.

Fig. 3.) It has been designed with special reference to the rapid and accurate cutting of bone. When I began some years ago to perform operations in bone surgery, I found that we were not as well provided with means for cutting bone as we should be. In order to operate satisfactorily upon bones, it seemed to me that we should be able to cut them with as much ease and accuracy as we cut the soft parts with a sharp scalpel. The chisel, which, for the most part, has been the bone-cutting instrument heretofore employed by surgeons in their conservative operations, does not fulfil these indications. In the electro-osteotome, however, as will be seen as we proceed with the operation to-day, we have an instrument which at once places the surgeon in full command of the situation, and enables him to promptly meet all indications. I have now performed a large number of operations with the electro-osteotome, and am thoroughly convinced that it is far superior to any other instrument in existence for performing the varied opera-

FIG. 3.

Electro-Osteotome.

Electrical Illuminating Apparatus, and a New Form of Portable Storage-Battery." Communicated to the New York Academy of Medicine, February 19, 1885; published in the *New York Medical Monthly* for October, 1886.

tions in bone surgery. The instrument which I will use on the present occasion is a new one, and has some improvements over the old one which I have been using for a number of months. As this is the first time I have had occasion to use it since it came from the shop, I hope you will make allowance for any delay that may arise in consequence.

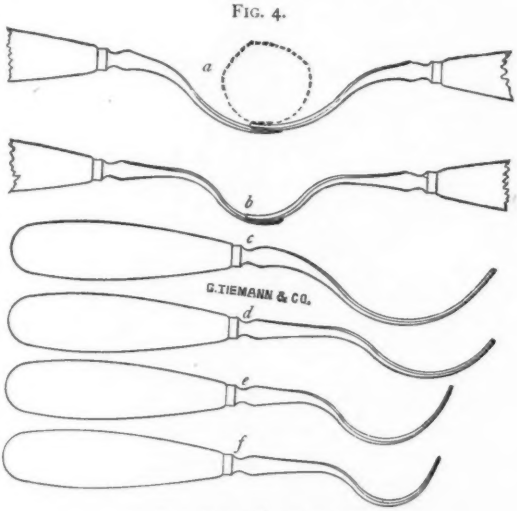
The patient having now been anæsthetized, and his lower extremities thoroughly cleansed, first by the use of soap and water, and subsequently by rinsing in a solution of corrosive sublimate (1 to 1000), a carbolized Esmarch's bandage is tightly applied, beginning at the toes and carrying it up the limb to the upper part of the thigh, where it is made fast. Removing the lower part of the bandage, we have a bloodless limb upon which to operate.

The first step in the operation is to make a longitudinal incision down to the bone along the anterior aspect of the tibia over the site of the greatest deformity. Care should be taken in making this incision not to carry the knife through the periosteum, thus injuring it unnecessarily. Having made a clean-cut incision down to the bone, the soft parts on either side of the incision are picked up with a pair of dressing forceps, and the cellular tissue between them and the bone is divided with a scalpel, so as to admit, without the use of undue force, the end of the protecting retractor which is placed between the soft parts and the bone.

The forms of protecting retractors used for this purpose are illustrated in Fig. 4. Those at *a* and *b* are in pairs, while those at *c*, *d*, *e*, and *f* are single, and are provided with much longer blades, which are curved up so as to serve the same purpose as a pair of retractors with shorter curves. The single retractors are much more difficult of introduction on account of the increased length of curvature. These retractors are placed in position by passing them in around the bone, between it and the soft parts, so that when they are in position the bone lies directly upon them and the soft parts are behind them. In this way the soft parts are absolutely protected from all danger of being cut while using the circular saw of the electro-osteotome.

The bone being thus exposed, its exact diameter at the site of operation is readily determined by means of a pair of calipers. The diameter of the right tibia we ascertain to be in the present instance twenty-four millimetres.

FIG. 4.



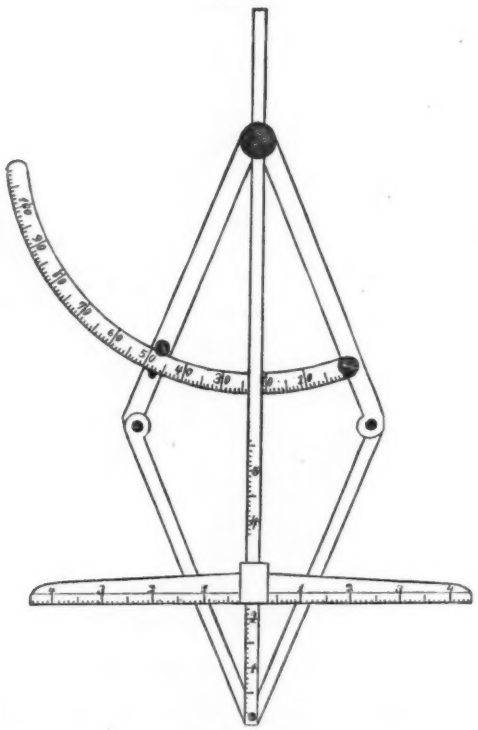
Form of protecting retractors.

The next step is to determine the exact dimensions of the base of the wedge of bone to be removed in order to correct this deformity. For this special purpose I have invented a mathematical instrument* (Fig. 5), which, given the degree of deformity to be corrected and the diameter of the deformed bone, will automatically calculate the dimensions in millimetres of the base of the wedge of bone to be removed to exactly correct the deformity, thus saving a somewhat elaborate trigonometrical calculation. This instrument—the

* "The Sphenometer; a New Instrument of Precision in Bone Surgery;" *New York Medical Journal*, November 20, 1886.

sphenometer—is used as follows: The lateral shafts, all four of which are of the same length, are set so as to enclose the angle of deformity. We have already determined in the present case that the angle of deformity is forty-five degrees, therefore we move the instrument so that the inner edge of the lateral shaft over which the graduated arc passes coincides with the line indicating forty-five degrees on the arc. (See Fig. 5.) Thus set, the lateral arms of the instrument enclose an angle equal to the degree of deformity. It

FIG. 5.



Sphenometer.

will be understood, from an examination of the diagram (Fig. 6) that the sides of the wedge-shaped piece of bone to be removed to correct this deformity, indicated by dotted lines *c*, *x*, *d*, must be inclined to each other, so as to enclose an angle of equal extent to that of the deformity, *d*, *o*, *b*, to be corrected, viz., forty-five degrees. Having set the instrument so that its lateral shafts enclose the angle of aberration, it can readily be seen that the dimensions of the base of the wedge depend entirely upon the diameter of the bone at the site of the operation. (See Fig. 6, in which *j*, *k*, *h*, *i*, and *f*, *g* represent varying diameters of bone and corresponding increasing dimensions of base of wedge.) We have determined the diameter of the right tibia in the present instance to be twenty-four millimetres. Upon the central arm of the sphenometer, which is graduated in millimetres, a straight bar, also graduated in millimetres from its middle towards either end, is made to slide at right angles to it. This graduated bar, at right angles to the central shaft, is moved along until the diameter of the bone at the site of operation has been measured off on the central arm of the sphenometer. (See Fig. 5.) Having done this, we can now read off from the graduated bar, which passes over the lateral limbs of the instrument, the dimensions in millimetres of the base of the wedge of bone necessary to be removed in order to correct the deformity. It will be seen by reference to Fig. 5 that the straight movable bar is graduated both ways from its middle, and therefore it is necessary, when reading off the dimensions of the base of the wedge, to count the graduations included between the lateral shafts of the instrument on both sides of the central shaft. The base of

the wedge we find in the present instance to be eighteen millimetres. (See Fig. 5, nine millimetres being indicated on either side of the central shaft of the sphenometer.) Eighteen millimetres are, therefore, marked off on the convex surface of the bone. Selecting an imaginary point on the opposite side of the bone, midway between the millimetre markings on the convex side, I take the electro-osteotome in hand, close the circuit, and cut obliquely through the bone to the imaginary point on the opposite side, such division of the bone requiring, as you observe, only about two seconds. The second oblique section of the bone is begun eighteen millimetres away from the first on the convex side of the bone, and the direction of the cut is such as to reach the opposite side of the bone at the same point as in the first section. Removing this wedge and coaptating the two cut ends of bone, it will be found that the deformity has been completely and perfectly reduced. But the cut ends of this divided tibia cannot be coaptated until we have removed a small wedge of bone from the fibula. Therefore we will proceed to do for the fibula what has already been done for the tibia. Instead of endeavoring to get at the fibula through the opening which I have already made, I will make a separate opening upon the external aspect of the limb through which to reach the fibula and cut down to it. Placing the protecting retractors in position, the bone is brought into full view, as already described. By the use of the bone calipers I can now readily measure the diameter of the bone. This I find to be ten millimetres. With the sphenometer set at the angle of aberration, viz., forty-five degrees, I move the graduated bar, passing over the lateral shafts of the sphenometer along until ten millimetres have been measured off. I can now see at a glance that the base of the wedge to be removed from the fibula measures nine millimetres. I proceed, therefore, to cut out this wedge by means of the electro-osteotome in the same manner that I did for the tibia.

These wedges of bone having been now removed from the tibia and fibula, and the distal end of the limb so placed as to coaptate

FIG. 6.

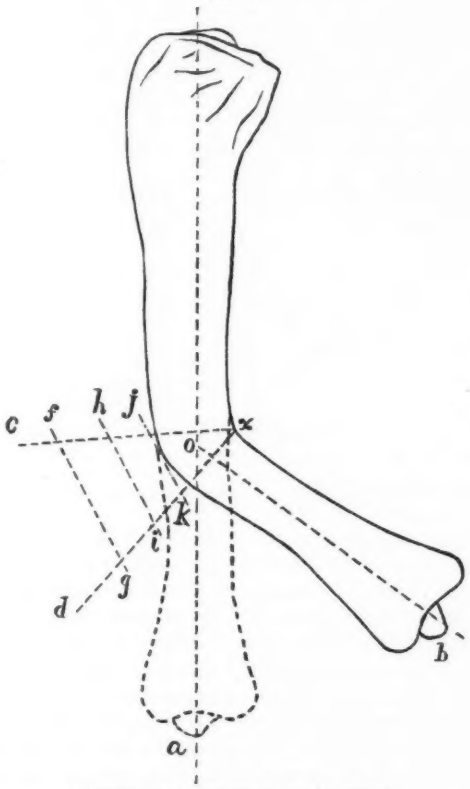


Diagram of tibia, showing wedge to be removed.

the cut ends of bone, you see that the anterior deformity has been completely and accurately corrected. There has been no undue force used, no jarring, pulling, tearing, or laceration of tissue, such as is incident to the use of the chisel and mallet. No undue manipulation or force is required to bring the limb into line when the proper-sized wedges of bone have been removed. If any of you, gentlemen, have ever been present at an operation for the correction of a deformity of this kind, where the chisel has been used as the bone-cutting instrument, you cannot have failed to have noticed the great muscular exertion sometimes necessary on the part of the surgeon to get the limb into line after he has ceased to use the chisel. The reason of this is that the bone is, as a rule, only partially divided by the chisel. The remaining portion is then broken off by manual force, and the limb carried, if possible, slightly beyond the point necessary to correct the deformity, and the dressing applied. No such clean-cut or complete section of the bone as the electro-osteotome makes is made, and no instrument of precision serves to guide the surgeon in his manœuvres. It is my belief that by such or similar means as you have seen me use to-day, bone surgery, so far as the correction of angular deformity is concerned, is capable of being practised as an exact science, thus doing away at once with all guess-work. Placing antiseptic sponges over the site of these incisions, and securing them in place by a firmly-applied roller-bandage, the Esmarch's bandage is removed from the upper part of the thigh, and the blood again permitted to flow through the limb.

Leaving the right limb for the present thus bandaged, we will proceed to operate in precisely the same manner upon the bones of the left leg. Having completed the removal of the wedges of bone from the tibia and fibula of the left limb, we place carbolized sponges over the sites of the incisions, secure them in place by means of a roller-bandage, and remove the Esmarch's bandage as before. We are now ready to again direct our attention to the right limb. Sufficient time has elapsed since the removal of the Esmarch's bandage from the right thigh to permit the blood-vessels and capillaries to regain their former tonicity, so that no annoyance from oozing of blood need be apprehended. I shall, therefore, remove the bandage which has secured the sponges in place, and proceed to pass a suture through the divided ends of the bones, so as to hold them in perfect coaptation during the healing process. To this end I replace the circular-saw head-piece of the osteotome with that designed for the carrying of drills. Introducing a fine drill, I make the necessary drill-holes in the bones, one at each end, for the purpose of passing the sutures through. Instead of drilling through the bone at right angles to its long axis, I am in the habit of commencing about half an inch from the margin of the cut on the convex aspect of the bone, and inclining the drill at such an angle as will permit it to emerge on the cut end of the bone, nearly on the opposite side, as indicated by the arrow *a*, Fig. 7.

FIG. 7.

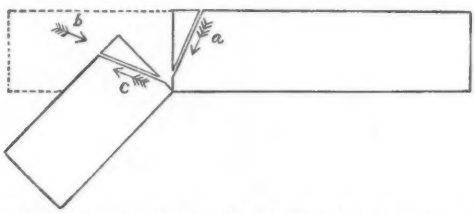
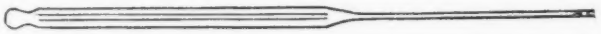


Diagram showing position of drill-holes and direction of passing sutures through the bones.

To retain the cut ends of the bone in coaptation, I am in the habit of using absorbable sutures instead of wire. After the dressing is applied, which, of course, is a permanent one, the sutures are absorbed, and the union of bone goes on uninterruptedly. Of late I have been making use of tendons from the tail of the Australian kangaroo, kindly forwarded to me for trial by Mr. A. E. Beach, of the *Scientific American*, who received them direct from Australia. These tendons are exceedingly strong, and are not as readily absorbed as the ordinary catgut sutures, remaining intact for a period of from eight to ten or more days without artificial preparation. I have forwarded some of them to Mr. Geo. J. Seabury, manufacturer of surgical dressings, and he informs me that in strength they are superior to any substance he has ever seen used for absorbable sutures.

I have also written to Australia for a tresh supply, and hope ere long that these tendons, properly prepared and assorted, will be placed upon the market, as I believe them to be of great practical service where a strong absorbable suture is required. In the introduction of these sutures I make use of an instrument of the form illustrated in Fig. 8. To introduce the suture, it is laid in the fork at the end of the instrument, and shoved down through the drill-hole, as indicated by the arrow *a*, Fig. 7, and out into the space left by the removal of the wedge-shaped piece of bone. Withdrawing the instrument, the suture is left in position. By means of the side hook near the end of the instrument the suture is picked up and drawn through as far as desired, when it is again released. The instrument is now passed down through the drill-hole in the other cut end of the bone, as indicated by the arrow *b*. It is pushed out through the lower opening, and the suture engaged by means of the hook. The instrument is then withdrawn, as indicated by the arrow *c*, and with it the suture. The cut ends of the bone are now placed in apposition, as indicated by the dotted lines, Fig. 7, and secured by tying the suture.

FIG. 8.



Instrument introducing sutures.

Having now secured the divided ends of the tibia and fibula in apposition by kangaroo tendons, the incisions through the soft parts are closed by means of a continuous suture of the same material. For a long time I was in the habit of applying the permanent dressings in operations like this without suturing the bones, and have had most excellent results from this practice. I have never had a single example of non-union, and in only one instance was there delayed union. Extraordinary care, however, is necessary in applying the permanent dressings, without suturing the bones, to keep their cut ends in apposition. By using absorbable material instead of wire to hold the ends of bones together sutures cease to be objectionable, while at the same time absolute certainty of apposition of bone is secured.

Now as to the dressing of these cases. This is a matter of considerable importance; in fact, a chief feature in the successful issue of such operations. The first essential condition is to be certain that the cut ends of bone are held in complete apposition. This we have already done by means of sutures of kangaroo tendons. It is intended that the dressings which are applied shall not be removed until four to six weeks have elapsed. Unless I can make arrangements so that the patient can be retained here in the hospital, the mother will, with my permission, take this child to Newburgh this evening. So you see we have some confidence in the method adopted in the treatment of these cases.

Plaster of Paris, silicate of sodium, and other substances may, in conjunction with strips of cloth, be used in making retentive splints for cases of this class. Wire gauze may also be used. Gutta-percha is the material, however, which I prefer above all others for this purpose. When made pliable by being dipped in hot water it can be perfectly moulded to any part of the body, and when set never becomes soft by discharges from wounds or other sources. It has the advantage over plaster of Paris in being a cleanly dressing to apply, not soiling the hands or clothes. It is made in sheets of varying thicknesses. One of a quarter of an inch in thickness will be used on the present occasion. Holes should be punched in the sheets before they are cut up for use, so as to permit of the evaporation of the insensible perspiration from that part of the body to which it is applied. This may be done by ruling the surface of the sheet both ways, with lines about two inches apart, which cross each other at right angles, and punching holes with a punch at the intersection of these lines. Thus prepared, the gutta-percha is dipped into boiling water, or water heated to very nearly the boiling-point, and when thoroughly softened it is applied to the limb, which is held in position until the gutta-percha sets. As the gutta-percha begins to set very soon after it is removed from the hot water, it is of course essential to apply it as quickly as possible. It is of great advantage also to have the help of an assistant who is thoroughly familiar with the manipulation of gutta-percha and the various steps of the operation. It should be secured in position by means of a roller-bandage carried about it and the limbs. While still soft, any parts of the splint which project unduly may be readily trimmed off with a pair of scissors.

But, before the gutta-percha splint is applied, it is desirable to put some form of antiseptic dressing about the limb at the site of operation. In the past I have made use of carbolic acid, iodoform, and corrosive sublimate gauze. More recently I have been using hydronaphthol, which is a new antiseptic, and was introduced to the profession, I believe, by Dr. George R. Fowler.* I have been using it now for some time, and am very well pleased with it indeed. In fact, I may say I am quite of the opinion that it has a very brilliant future. The advantages claimed for hydronaphthol are its efficiency as an antiseptic and an antiputrefactive agent. It belongs to the phenol series. Though irritating to mucous membranes, it is a non-irritant to wounds. It is non-poisonous and non-corrosive, and on this account is far safer than carbolic acid used in strong solutions. It has been demonstrated that carbolic acid, in weak solutions at least, is a very unreliable antiseptic. Cases of poisoning from the use of iodoform and corrosive sublimate dressings are frequently reported in our medical journals. If, therefore, we have in hydronaphthol, as it appears, thus far, from all reliable sources of information, a non-poisonous and non-irritant antiseptic, it will meet with a hearty welcome from a large number of surgeons. It is used in the same strength solutions as corrosive sublimate.

Along the line of incision hydronaphthol in the form of powder is sprinkled. It may be mixed with equal parts of fuller's earth, if thought desirable, and used upon closed wounds in the same manner as iodoform. Over this a pad of six or eight thicknesses of hydronaphthol gauze is placed, and secured in position with a roller-bandage of hydronaphthol gauze carried about the limb.

Thus prepared, the limb is ready to be placed in the retentive splint of gutta-percha. When the gutta-percha splints have been applied in the manner already described, and secured in position by roller-bandage, our patient is ready for transportation. (See Fig. 9.) Usually patients thus operated upon and thus dressed will recover without an un-

FIG. 9.

Patient with limbs dressed.

* *Vide The New York Medical Journal*, October 3, 10, 24, and December 5, 1885.

toward symptom. They should, however, be carefully watched, the temperature being taken twice or three times daily. If there is a rise in temperature above 101°, which cannot be traced to any outside source of irritation, the wound should be examined at once. In very young children the greatest possible care is essential in keeping the dressings perfectly dry. The patient should be placed in bed, and the legs inclined at an angle of about forty-five degrees from the surface upon which he is lying. Kept in this position, the dressings are not likely to become soiled by urine or other excreta.

(To be continued.)

ANTIFEBRIN.

By William Osler, M.D.*

A FEW months ago Drs. Cahn and Hepp announced from Kussmaul's clinic the discovery of a new antipyretic, which they named antifebrin. A full account of their observations has more recently appeared in the *Berliner Klinische Wochenschrift*, Nos. 1 and 2, 1887.

The drug is known chemically as phenyl-acetamide or acetanilide ($C_6H_5C_2H_3OHN$), and is formed by the action of heat upon aniline acetate. It is a neutral body, and in this respect it differs from all other antipyretics, which are either phenols, like salicylic acid and resorcin, or bases of the chinoline series, as thallin, antipyrin, and quinine. It is a white crystalline powder, insoluble in cold water, but readily dissolving in hot water or alcoholic solutions. The taste is not unpleasant. The dose is from 8 to 12 grains. In larger amounts it is not poisonous, though it is advisable not to exceed 30 grains in the day. Usually 8 grains will be found an effective dose. It is conveniently given in spirit and water, or in whiskey, or, for children, in warm sweetened water.

During the past three months I have used it in my wards at the Philadelphia Hospital and at the Hospital of the University of Pennsylvania in the following 29 cases: typhoid fever, 7; pneumonia, 6; phthisis, 8; erysipelas, 4; pleurisy, 1; peritonitis, 1; rheumatism, 1; intermittent fever, 1. As a rule, 8 grains were given when the temperature rose above 103⅘°, and hourly observations were made for six or eight hours. In several cases of phthisis 4 grains were given four or five times a day. The maximum amount given in one day was 32 grains (Case II.). For brevity, the effects of the drug may be noted under the following heads:

1. *Reduction of Temperature.*—This is the most marked and characteristic action, beginning usually within an hour. In eighteen administrations the fall was over 2° in this time; in three instances a fall of 3°, on two occasions a fall of 4°. In thirteen instances the temperature was reduced 4° in two hours, in sixteen administrations 3°, and on four occasions 5°. The greatest drop within this time was in Case XXIV., in which the fall was 6⅘°. The greatest reduction was in the following: Case I., 8° in five hours; Case X., 6⅘° in five and a half hours; Case XVIII., 7⅘° in two and a half hours; Case XX., 7° in seven hours; Case XIX., 7⅘° in ten hours.

In seven administrations the temperature was unaffected by the eight grains. Cases VII. and XIII., both of pneumonia; Case XXIII., peritonitis; and Cases IX. and XVIII., erysipelas.

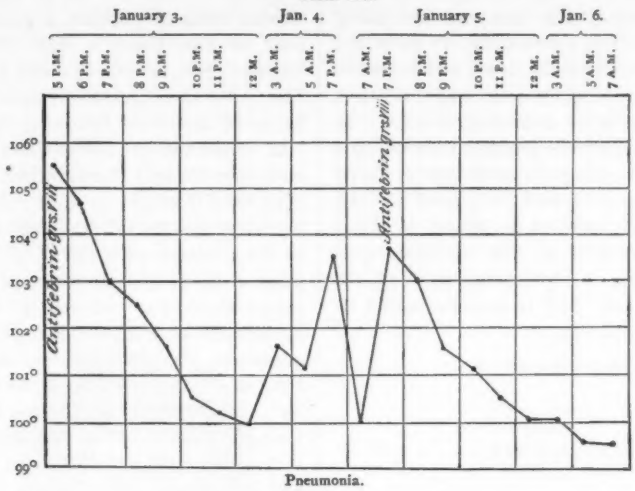
The duration of the reduction was variable, usually from three to six hours. The following cases illustrate well the antipyretic action of this drug:

Case XI. (Chart I.).—Man, aged 32, admitted to the drunkards' ward of the Philadelphia Hospital. A few days after admission he was noticed to be a little short of breath, and, on examination of the lungs, there was dulness, with râles and feeble blowing breathing at the right base. On January 3, at 5 P.M., the temperature was 105⅘°. Antifebrin, gr. viii, was given, and the fever gradually fell, as the chart shows, until midnight, reaching 100°. By 3 A.M. it had risen to 101⅘°. At 7 P.M. on the 5th the temperature was nearly 104°, and another dose of the antifebrin was given with good effect.

Case IV. (Chart II.).—Rachel C., aged 21, admitted November 3 with typhoid fever. On the 4th the temperature was 104°, but from this date until the 13th it did not rise above 103°. At 8 P.M. on the 13th the temperature was 104⅘°. Antifebrin, gr. viii, was given. By ten o'clock there was a fall of 5°, with profuse sweating. At 11 P.M. the temperature was 97°. At 12 A.M. it began to rise, and by 2 A.M. was 99.4°. Between eleven and twelve o'clock she complained of slight chilliness, but the general condition was good, and there was no collapse. The thermometer did not again register above 103⅘° in her case.

* Professor of Clinical Medicine in the University of Pennsylvania.

CASE XI.

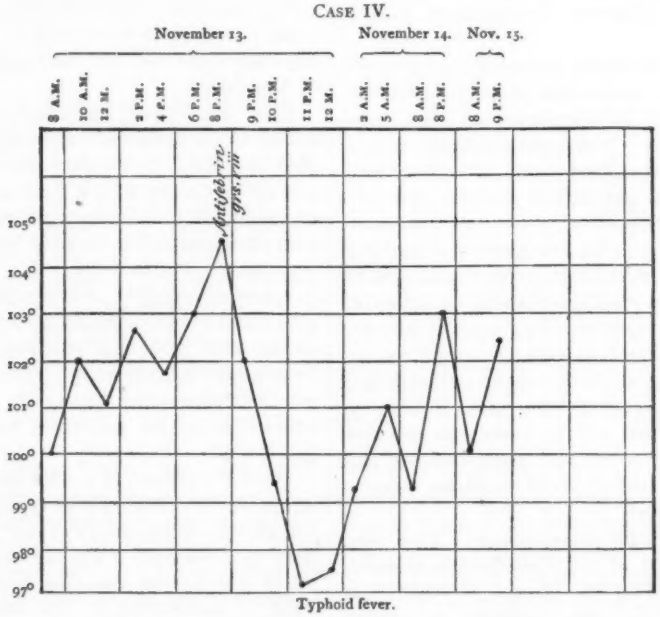


Pneumonia.

CASE X. (Chart III.).—J. B., aged 35, with chronic phthisis and high fever. The chart shows how rapidly the antifebrin in three successive days reduced the temperature from 4° to 7° in from two to three hours.

above 103°, and a second dose of antipyrin was given. At 5 P.M., quinine, gr. xx. He had had also quinine, gr. v, every four hours. At 8 P.M. the temperature had fallen to 100⅕°, at 11 P.M. to 99°, and at 3 A.M. to 98°. On

CASE IV.

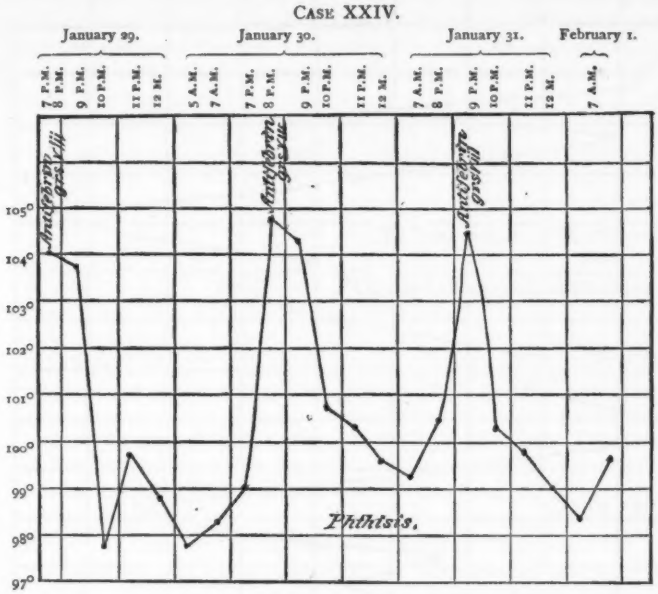


Typhoid fever.

CASE XVIII. (Chart IV.).—F. H., aged 31, was trephined for mastoid disease in Philadelphia Hospital January 15. On the 20th he was attacked with erysipelas. On the 23d, at 10 A.M., the temperature was 106⅖°; at 11, 105⅖°. He was given antipyrin, gr. xv, and quinine, gr. xx. At 3 P.M. the temperature was still

the 24th the fever was again 105°, and antipyrin and quinine were given, with a reduction of 4° in five hours. On the 25th antipyrin and quinine were twice given, without any effect. He was transferred to the medical ward, and the antifebrin was used as shown by the chart. The last dose caused a

CASE XXIV.



fall of $7\frac{3}{5}$° in two and a half hours. The patient subsequently did well. The chart is of interest, as it affords a comparison between the action of antipyrin with quinine, and that of antifebrin.

In several cases the dose of gr. viii did not seem sufficient. In seven administrations little or no effect followed. This was particularly noticeable in the pneumonia cases. In Case XIII., with almost complete involvement of the right lung and affection of the left base, the temperature from the 5th to the 10th ranged from 102° to 105°. Antifebrin was given six times, thrice without effect, and on three occasions it only reduced the fever a degree or a degree and a half. Thallin, gr. iv, twice brought the temperature down 3° and 4°; but the most effective agent in this case seemed to be the cold pack, which reduced the temperature from 105° to $98\frac{4}{5}$°. This patient had delayed resolution, and the fever did not subside until the thirty-ninth day from the initial chill. In other instances, a second dose repeated an hour or more after the first produced the full effect, as in Cases XI. and XVIII.

In typhoid fever the action was usually prompt and satisfactory. In Case II., a young man, aged 25, with persistently high temperature and marked nervous symptoms, the drug was given on fourteen occasions, and after each dose there was a drop of from 3° to 5°. In the milder cases the effect was more striking, as in Case IV.

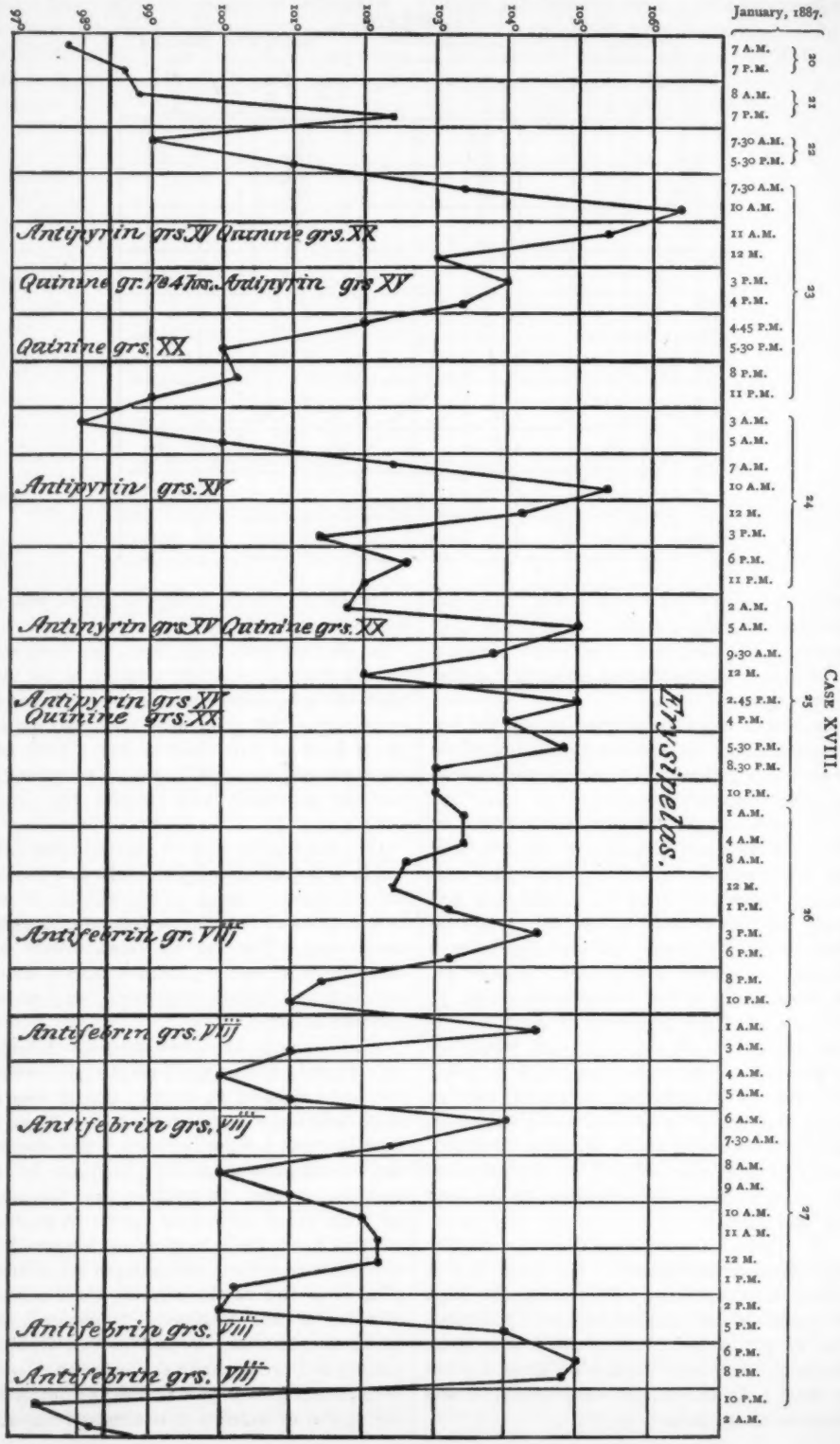
In the erysipelas cases the action was in each instance most decided.

In phthisis, with high fever, the drug was usually given in a single powder of gr. viii, when the temperature was above 103°, but in three cases the plan was tried of giving gr. iv four or five times a day. This did not seem very successful, and the patients did not feel so comfortable as with the single dose.

In a remarkable case of quartan ague antifebrin in 8-grain doses given before or during the paroxysm seemed to be without effect. One curious circumstance, however, is worth mentioning. The lad had always with the fever the most intense general urticaria, which the antifebrin seemed to prevent, much to the patient's comfort.

2. *Action on the Circulatory System.*—Usually with the reduction of the fever the pulse would fall, and a drop of 20 or 30 beats in two or three hours was frequently noted. Thus, in Case II., with a pulse-rate of 112 per minute, and the temperature at 105°, the pulse fell to 84 in four hours. In another case the pulse fell from 130 to 90 in four hours. A marked increase in the pulse-tension was observed in several cases. Even with a rapid fall of from 5° to 7° in two or three hours, there was no evidence of heart-weakness. Slight cyanosis, which is mentioned by one or two German writers, did not occur in any instance.

3. *Sweating.*—As with thallin and antipyrin, the action of antifebrin is almost invariably


January, 1887.
Antipyrin grs.XV Quinine grs.XX
Quinine gr.V 8 4/5 hs. Antipyrin grs XV
Quinine grs. XX
Antipyrin grs.XV
Antipyrin grs.XV Quinine grs. XX
Antipyrin grs.XV Quinine grs.XX
Erysipelas.
Antifebrin gr. VIIJ
Antifebrin grs. VIIJ
Antifebrin grs. VIIJ
Antifebrin grs. VIIJ
Antifebrin grs. VIIJ
Case XVIII.

accompanied with profuse perspiration, which is often the first effect of the drug. Repeatedly I have seen the forehead beaded with sweat half an hour after the administration of 8 grains. This is sometimes a most unpleasant feature in the employment of the drug, and is the only one of which the patients have complained. In several instances the drug was combined with atropine, but without much effect. It does not seem to increase the night-sweats in cases of phthisis; indeed, under its use, one patient, who sweated much with the afternoon dose, had drier and, in consequence, more comfortable nights. In the severe typhoid case already referred to, I stopped its use, as the sweating seemed to weaken the patient.

4. *On the Urine.*—The only change noted was a marked increase in the amount in some of the cases. This is probably a direct result of the increased arterial tension.

5. The effect on the general condition seemed usually beneficial. A quiet sleep often followed an hour or so after its administration. The phthisical patients expressed themselves more positively than the others in this matter.

There were none of the disagreeable effects which we sometimes see follow the use of antipyrin and thallin. There was no instance of vomiting; and, with the exception of Case IV., there was no shivering or chilliness, such as is so common after antipyrin.

These limited observations confirm those of Cahn and Hepp and others, and I think that we have in antifebrin a prompt and powerful antifebrile agent, easy to take, and free from unpleasant effects. It has the advantage also of cheapness. Merck's article, which I have used, is only sixty cents an ounce, wholesale.

Pharmacological Contributions from the University of Pennsylvania.

THE PHYSIOLOGICAL ACTION OF THE VALERIANATE OF AMMONIUM ON THE NERVOUS SYSTEM.

By Wm. E. Parke, M.D., Parkesburg, Pa.

So far as I have been able to learn, no study has been made of the physiological action of valerianate of ammonium on the nervous system, and whatever value may attach to the conclusions arrived at in this paper, the experiments will at least have the merit of being the first in the field.

A number of experiments were first made on the frog to ascertain the general action of the drug on the system. Large and small amounts of the solution of the drug were injected into the peritoneal cavity of the animals, and their movements noted.

Administration of small amounts was followed in a few moments by clonic contractions of muscles over the whole body, and slight exaltation of the reflex action. If the size of the dose was increased the clonic contractions gave place to tetanic spasm and reflex action was lost, and when large toxic doses were given paralysis resulted almost at once. Whether convulsions or paralysis result appears to be determined by the size of the dose. The frog passes from convulsions into stupor, and from stupor to death.

Curiously enough, the physiological action of the drug was manifested sooner and much more powerfully in the fore than in the hind extremities. Thus, after the drug was given, clonic contractions appeared first in the fore legs, and were followed by tetanic convulsions in these parts, in which the legs were drawn up firmly against the belly. At this moment the hind legs were either not affected or were in the stage of clonic convulsions. At the autopsy it was found that the animal's heart was beating after it was completely dead to all nerve-excitation, thus pointing to the fact that the drug is pre-eminently a *nerve*-poison. (See Experiments 1, 2, 3, 4, 5.)

To determine whether the convulsions were cerebral or spinal in origin, section was made through the medulla, thus dividing the brain from the cord, and the drug given. It was found that the convulsions were still present, thus showing that they must be spinal. (See Experiment 6.)

The study of the reflexes was somewhat confusing, the evidence of different experiments seeming contradictory. In working out this part of the investigation the medulla of the frog was destroyed. A few minutes were then allowed to elapse for the animal to recover from the shock of the operation. A slightly acidulated solution was prepared, and the frog was suspended, with hind extremities in the solution. The time, from the moment of immersion until a reflex action was produced, was noted at intervals of five minutes. The acid solution was carefully washed off of the frog's legs after each immersion. The acid solution would of course furnish a uniform method of irritation. After the time of reflex was ascertained, the drug was given, and a second series of observations similar to

the first was made. In some of the experiments injection of the drug was followed by an exalted reflex,—*i.e.*, the reflex appeared sooner after the drug was given than before. In others the reflexes were probably either not altered or lowered. (Compare Experiments 6, 8, 11 and 7, 10, 12.)

It appears that when a small dose of the drug is given, or when only a small amount has been absorbed, the reflexes are exalted, but when the dose is large then the reflexes are lowered. These results would seem to indicate that the drug in small doses acts as a stimulant, and in large doses as a depressant, to the spinal cord.

In cases where the cerebrum was destroyed, it was found that the animal was little affected by doses which soon took life when the medulla alone was destroyed (or probably even when all the nervous system was intact). Thus, in Experiments 11 and 12, such doses as in Experiments 7 and 9 killed, were followed by no symptoms. This would seem to indicate that the drug is more of a poison to the brain than to the cord.

In order to ascertain whether the action of the drug on reflexes was peripheral or spinal, the vessels of one hind leg were ligated, the medulla having previously been destroyed. The method of doing this was as follows: The sciatic nerve was exposed, and carefully raised so as to pass a ligature under. This ligature was passed around all the other tissues of the limb, thus cutting off the circulation to the part. Now the drug was given, and it was found that the reflex continued in both the ligated and the unligated limb. (See Experiment 13.) Of course, after the ligation, the drug could not reach the peripheral nerve-endings, and, as the reflex action was maintained, we must believe that the action of the drug is spinal.

In studying the local action of the drug, the various parts of the nervous apparatus—*i.e.*, brain, cord, and nerves—were laid bare, and a crystal of the valerianate was placed directly upon them. Previous to this, however, the normal excitability of the nerve was ascertained by touching it with the electrode of a DuBois-Reymond induction coil, connected with a one-cell battery, the secondary coil or bobbin being moved up or down as required. The farther the bobbin is removed from the primary coil the weaker the current,—*i.e.*, twelve centimetres equals a weaker current than six centimetres.

It was noticed in every instance that a stronger current was required to excite a contraction of the muscle after a crystal was placed upon the nerve than before. Also, if the electrode was applied to the distal side of the crystal, it required a much stronger current to excite a reflex movement than before. So it is evident that the power of conduction in the nerve is very considerably decreased. This, of course, could be due to two things,—either to the physiological action of the drug upon the nerve by imbibition, or to destruction or disintegration of the nerve-fibre by direct action. That it was at least in part due to the latter is not improbable, for it was observed that when the crystal was placed on the nerve the surrounding tissues appeared bleached; however, the macroscopic appearance of the nerve itself was not changed. (See Experiments 14 and 15.)

When the cord was laid bare and treated in a similar way, the same result followed with respect to conduction of current,—*i.e.*, it passed the point of contact of the crystal only with difficulty or not at all. But when the electrode was placed in front of the crystal, the fore extremities contracted, and when placed back of the crystal, the hind extremities contracted. No doubt one factor in this obstruction to the current was the direct *local action* of the drug on the part, as suggested above; but there can be little doubt also that it was in part due to the *physiological* action of the drug. (See Experiments 16 and 17.)

It was noticed that immediately after the crystal was placed upon the cord there were tremors or clonic contractions of the front and hind legs. These phenomena were of course referable to the same cause as noted above when the drug was given hypodermically.

When a crystal of the valerianate was placed on the exposed brain there was at first considerable excitement; however, no more probably than would be produced by an irritant. The drug was of acid reaction, and would thus act. After a little time the animal became quiet, and was not easily disturbed, but when aroused moved around with difficulty. Later, it lay in a stupid condition, thus manifesting the depressant action of the drug upon the brain. (See Experiment 18.)

For a record of the experiments and conclusions see the following:

Experiment 1.—Frog healthy.

P.M.

1.35. 10 minims of a 1 per cent. solution administered.
1.38. Clonic contraction of muscles over whole body.
1.50. Frog in a stupor and reflexes dulled.

P.M.
2.10. Fore legs drawn close under the belly, and reflexes absent in them. Occasional kicking out with hind legs.
2.30. Frog still in a torpid condition; reflexes dulled.

Experiment 2.—Frog healthy.

P.M.
1.00. 10 minims of a 5 per cent. solution administered.
1.05. Tetanic convulsions of all the limbs, more noticeable in fore than hind legs; reflexes good.
1.15. Fore legs paralyzed and drawn close under the body; reflexes still good in hind limbs.
1.30. Reflexes good in hind legs.
2.30. Reflexes in all legs, but better in hind legs.

Experiment 3.—Frog normal.

P.M.
1.30. 15 minims of a 1 per cent. solution administered.
1.33. Clonic contractions of whole body.
1.45. Reflexes good.
2.30. Frog active; exalted reflex.
One day later. Frog living and apparently healthy.

Experiment 4.—Frog normal.

P.M.
1.20. 15 minims of a 10 per cent. solution administered.
1.25. Clonic spasms anteriorly and posteriorly; reflexes good.
1.35. Reflexes in hind extremities still good. Paralysis apparent, and all sensation lost in right fore foot.
1.40. Fore legs paralyzed.
2.15. Frog dead.

Experiment 5.—Frog normal.

P.M.
1.50. 60 minims of a 10 per cent. solution administered. When placed in water the frog lies flat on its belly.
2.00. Lying more on left than right side; pushes itself wearily around. Legs on left side seem paralyzed.
2.10. Slight efforts made by right fore leg. When pricked manifests no signs of pain.
2.30. Frog dead without a struggle.

Experiment 6.—Medulla and brain destroyed.

P.M.
2.55. 15 minims of a 1 per cent. solution injected, followed by very insignificant clonic contractions.
3.20. Reflexes good, probably exaggerated; fore parts more affected than the hind parts; fore legs drawn closely under the belly, and reflex very good in hind legs.
5.15. Exalted reflex in hind legs; none in fore legs.

Experiment 7.—

A.M.
9.40. Medulla destroyed.
The time of reflexes was noted by dipping the hind legs of the animal in acidulated solution.
10.10. Reflex in 1 second.
10.15. Reflex in 2 seconds.
10.20. Reflex in 2 seconds.
A.M.
10.22. 5 minims of a 2 per cent. solution injected (small frog).
10.26. Reflex in 6 seconds.
10.30. Reflex in 9 seconds.
10.35. Frog dead.

Experiment 8.—

A.M.
9.45. Medulla destroyed.
10.10. Reflex in 1½ seconds.
10.15. Reflex in 3 seconds.
10.20. Reflex in 5 seconds.
10.23. 10 minims of a 2 per cent. solution injected (large frog).
10.27. Reflex in 3 seconds.
10.30. Reflex in 6 seconds.
10.35. Reflex in 7 seconds.
10.45. Reflex in 9 seconds.
10.47. 10 minims more solution injected.
10.50. Reflex in 9 seconds.
10.55. Reflex in 10 seconds.
11.00. Reflex in 11 seconds.
11.15. Reflex in 12 seconds.
11.30. Reflex in 15 seconds.
11.45. Reflex in 15 seconds. Feeble response.

Experiment 9.—

P.M.
1.30. Medulla destroyed.
1.45. Reflex in 10 seconds.
1.50. Reflex in 13 seconds.
1.55. Reflex in 14 seconds.
2.00. Reflex in 20 seconds.
2.02. 10 minims of a 2 per cent. solution injected.
2.08. Reflex in 85 seconds.
2.15. No reflex in 250 seconds.
2.55. Frog dead to all nerve-stimulus. Heart continues to beat long after sensation is lost, so the drug seems to be a nerve-poison.

Experiment 10.—

P.M.
2.10. Medulla destroyed.
2.45. Reflex in 25 seconds.
2.50. Reflex in 25 seconds.
2.53. 10 minims of a 2 per cent. solution injected.
2.57. Reflex in 36 seconds.
3.08. Reflex in 28 seconds.
3.20. No reflex in 100 seconds.

Experiment 11.—

A.M.
10.30. Cerebrum destroyed.
11.00. 10 minims of a 2 per cent. solution injected.
11.30. No symptoms manifested in half an hour.
P.M.
2.05. 10 minims more solution given; no symptoms.
2.20. More of the drug administered without any apparent effect.
One day later. Frog still alive, and reflexes very active.
P.M.
1.40. 60 minims of a 2 per cent. solution injected; no tremors followed, but the frog made an occasional desperate jump.
2.10. Frog dead.

Experiment 12.—Brain destroyed.

P.M.

2.00. 30 minims solution injected; this amount killed a frog with medulla destroyed in about half an hour.

The hypodermic needle was introduced under the skin in right side, and in a few moments afterwards the frog began to move around towards the right, and showed slight signs of twitching. Probably the brain was not wholly destroyed, and this may account for the symptoms.

2.10. Reflexes good.

2.50. Reflexes good.

3.15. Reflexes still good, but no other symptoms worth noting were observed.

Two days later. Frog still living; reflexes good. The experiment shows that the drug will not kill in the same time or with the same amounts when the brain is destroyed as when the medulla is destroyed.

1.35. 60 minims of a 2 per cent. solution injected into the peritoneum.

1.40. Reflexes considerably dulled.

3.20. Reflexes still very dull.

Experiment 13.—

P.M.

2.08. Medulla destroyed.

2.15. Blood-vessels of one hind leg ligated; reflexes good in both legs.

2.20. 5 minims of a 2 per cent. solution injected into the peritoneum; reflexes good in both legs.

2.25. Reflexes good in both hind legs.

2.30. Reflexes good in both hind legs.

2.40. Reflexes slightly impaired in both hind legs.

2.53. Reflexes gone in both hind legs.

In the following experiments the current used was that of the DuBois-Reymond induction coil and one-cell battery. The number of centimetres named indicates the distance between the primary and secondary coils.

Experiment 14.—

P.M.

3.00. Medulla destroyed.

3.08. Secondary coil removed 27 centimetres from primary gives minimum contraction of muscles.

3.18. 32 centimetres gives minimum contraction.

3.20. Crystal of the valerianate laid on the exposed sciatic nerve.

3.30. 18 centimetres gives minimum contraction.

3.35. Another crystal laid on the exposed nerve. The crystal seems to bleach the muscle where it touches, but no change appears in the color of the nerve. When the electrode is applied below the point where the crystal is placed upon the nerve, reflex action cannot be excited even with a very strong current.

3.45. Contraction obtained only when the bobbin is removed 12 centimetres.

4.00. 12 centimetres gives minimum contraction.

Experiment 15.—

A.M.

9.40. Medulla destroyed and sciatic nerve exposed.

A.M.

9.50. 28 centimetres gives response.

9.55. 30 centimetres gives pretty active contraction.

10.00. 31 centimetres gives contraction.

10.05. 32 centimetres gives active contraction.

10.10. Crystal of the valerianate laid on the exposed sciatic nerve of one leg. Bleaching of the tissues was observed, as noted above.

10.15. 13 centimetres gave a feeble response on the side upon which the crystal was placed, while 32 centimetres gave active contraction on the other side.

10.20. Another crystal placed on the exposed nerve.

10.30. 34 centimetres gave well-marked contraction on right side, but full strength of the battery gave no contraction on the side upon which the crystal was laid.

Experiment 16.—Medulla destroyed.

P.M.

1.45. Spinal cord laid bare.

1.55. Reflex in both fore and hind extremities, both on mechanical and electric irritation.

1.58. Crystal of the valerianate placed on the cord, followed by (1) tremors in the fore limbs; (2) tremors in the hind limbs.

2.10. Another crystal placed on the cord.

2.15. Electricity applied to cord.

When the electrode is placed on anterior part of the cord the fore limbs respond, but when placed behind the crystal only the hind limbs respond,—*i.e.*, the current was not conducted through the part of the cord where the valerianate was applied. Before the valerianate was laid on the cord 22 centimetres caused muscular contraction; afterwards the secondary coil had to be pushed up to 12 centimetres to produce contraction.

2.45. 10 centimetres gives response.

2.50. 8 centimetres gives contraction in the fore legs.
6 centimetres gives contraction in the hind legs.

Experiment 17.—

P.M.

2.00. Medulla destroyed and cord exposed.

2.10. 35 centimetres caused minimum response.

2.15. 26 centimetres caused response; crystal of the valerianate placed upon the cord; discoloration of the tissues marked.

2.20. 20 centimetres gives response.

Tremors occurred in the hind limbs after placing the crystal on the cord. The current of electricity does not seem to be able to pass through the part of the cord upon which the crystal has been placed.

2.38. 16 centimetres gave contraction in hind legs when the electrode was applied to the posterior part of the cord, and 17 centimetres gave contraction in fore legs when applied to the anterior part of the cord.

2.40. Another crystal of the valerianate placed on the cord.

2.50. 11 centimetres gives contraction of the anterior limbs; 12 centimetres gives contraction of the posterior limbs.

3.05. Frog only feebly responds in anterior limbs to full power of the battery.

Experiment 18.—

P.M.

2.25. Brain exposed.

2.30. Crystal of the valerianate laid on the exposed brain.

2.35. Frog jumping around considerably; no more, however, than might be produced by an irritant.

2.45. Another crystal placed on the brain.

2.55. Animal gives one or two kicks, but for the most part remains quiet and is not easily disturbed.

3.05. Frog seems scarcely able to move around. Another crystal laid on the brain. Frog remains stupid.

The drug was obtained from Rosengarten & Bros., and was of acid reaction. This probably gave rise to its irritant action.

The conclusions arrived at are as follows:

First.—With the exception of the convulsions, the drug is a universal depressant to the nervous system.

Second.—The convulsions are of spinal origin.

Third.—In small doses the drug probably stimulates the cord.

Fourth.—In large doses the drug depresses the cord.

Fifth.—Locally the drug is a universal depressant.

REMARKS ON THE THERAPEUTIC VALUE OF MANACA, JAMAICA DOGWOOD, AND EUPHORBIA PILULIFERA, VIBURNUM PRUNIFOLIUM.

By Allan S. Payne, M.D.*

I CONSIDER the Franciscea uniflora, manaca, one of the very best therapeutic remedies we have in cases of rheumatism, rheumatic gout, and eruptive diseases of syphilitic origin. I have seen many cases of chronic, subacute, and inflammatory rheumatism and syphilitic eruptions readily yield to the administration of the fluid ext. manaca, in doses ranging from 8 to 20 drops three times a day. I have been prescribing for the last eight years in my practice the manaca, and could, if I had the time, report numerous cases where its exhibition was of unquestioned value in inflammatory, subacute, and chronic rheumatism. In secondary and tertiary syphilis its action has been more prompt and more satisfactory to me than my old favorite remedies, iodide of potassium and sarsaparilla, or the bichloride hydrargyrum either. But as I gave my views freely some time ago through the columns of the Therapeutic Gazette as to the value of the fluid extract of manaca, I will now only say in my opinion it still holds its own, and pass on to the consideration of Euphorbia pilulifera. I have not had as much experience with this remedy as I could wish, having only prescribed it in three cases of spasmodic asthma, one case complicated with bronchial irritation.

Peter I., carpenter by trade, age 46, came to me in September, 1886, suffering with spasmodic asthma and bronchial irritation; complained of a sense of great weakness for want of breath; could not do any work at his trade; was always hale, hearty, and strong until during the war was confined in camp on the banks of the Appomattox; ever since had been subject to these asthmatic attacks. He was weaker, and considered this the worst attack he has ever had; had been longer unable to work than ever before. His complexion was sallow, skin dry and felt harsh to the hand, tongue coated with a thick whitish fur, urine scanty and high-colored. ℞ 5 grs. sulph. quinine, night and morning; gave him sub. mur. hydr., gr. x; ext. coly. comp., gr. x; pulvis ipecac., gr. i; ol. cajuput., gtt. ii; divide into two powders; take one at 3 P.M., the other at bedtime; next morning teaspoonful *Carlsbad salts* in glass cold water; fluid ext. Euphorbia pilulifera, 30 to 50 drops *pro re nata*. He came to my office day before yesterday for me to prescribe for his wife and daughter. He says he is stronger and better than he has been since the war, and that the little black drops cured him.

I. P., farmer and fox-hunter, has been subject to attacks of asthma since childhood, the attacks getting worse; is 27 years old; has tried a great many remedies without any permanent benefit; would be well and hearty if it were not for these attacks. ℞ 30 to 60 drops Euphorbia pilulifera *pro re nata*. Reports to me as having experienced great relief; has not had any attack this winter, although he has fox-hunted as much as usual; thinks the black drops cured him.

The other case I have not heard from; think he is also better, or I assuredly would have heard from him. This patient lives in an adjoining county. I have found the Piscidia erythrina (Jamaica dogwood) a valuable remedy in nervous persons, who cannot bear opiates, and in cases where you desire to promote an increase of the secretions rather than check them. The Jamaica dogwood seems to ease pain, promote refreshing sleep, and, if

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repeated, will gently move the bowels and increase the flow of urine. These properties render it an exceedingly valuable preparation in persons of peculiar nervous cachexia.

Viburnum Prunifolium (Black Haw).—The fluid extract of viburnum prunifolium is a valuable auxiliary in the field of gynæcology. In looking over the literature of this valuable drug I find it ample, so much so that I deem it unnecessary to say anything more in its favor than to express the opinion that those persons who believe it inert or worthless in a large number of diseases incident to the female organs of generation have made their experiments with worthless preparations of this drug. I have used the infusion made from the root of the black haw, but it is by no means as decided in its therapeutic action as the fluid extract. Its properties seem to be anodyne, tonic, and alterative, when administered per orem in sufficient doses. Its virtues are by reflex action or through the nerve-centres conveyed to the female organs of generation, and exert upon these important organs a benign influence not excelled by any drug with which I am acquainted. From its anodyne, tonic, and alterative action it has a wide range of adaptability in the field of gynæcology. I myself have used the fluid ext. of viburnum prunifolium in anæmic amenorrhœa, dysmenorrhœa, membranous dysmenorrhœa, and threatened abortions many, many times. I successfully treated three cases of membranous dysmenorrhœa in Atlanta, Georgia, at the same time and in the same hotel. Two cases were residents of Atlanta, the third a young lady from the far Northwest. And last summer a young lady from the valley of Virginia fell under my charge. I mention these four cases particularly because they were unusually severe cases, had been under the care for a long time of several able physicians, and their lives had become, as they expressed it, a "*misery to them.*" Of course in my practice of nearly half a century I have met many cases, moderate cases of simple and membranous dysmenorrhœa. My treatment in these four severe cases of membranous dysmenorrhœa was, keep bowels soluble with Carlsbad salts, and take the following:

℞ Fluid ext. phytolacca,
Fluid ext. cimicifuga racemosa, aa ℥iss;
Vinum colchicum sem., ℥iii;
Fluid amm. guiac., ℥v. M.
Sig.—30 drops t. i. d.

Just before the expected molimen take:

Camphor., gr. x;
Pulv. doveri, gr. x;
Ext. hyoscyami, gr. x.
Fiat 10 pills.

Two pills every two hours until pain ceases, then fluid ext. viburnum prunifolium 60 drops t. i. d.

To be continued until next molimen occurs. Plan of treatment to be continued until there is freedom from pain and an increase of the monthly discharge.

In a case of threatened miscarriage, the first thing for a woman to do is to go to bed and assume the horizontal position. The next is to get her bowels opened by a mild aperient, such as the Carlsbad salts, assisted in its action by an injection composed of mild ingredients. If there is pain after her bowels are opened, throw into the rectum 40 drops tinct. opii in a tablespoonful of starch and warm water, *tepid* water, and take a teaspoonful of viburnum prunifolium t. i. d. If the patient has been in the habit of miscarrying, whenever she feels the slightest pain she should go to bed, throw into her rectum the starch and laudanum injection, and take a dose or two of the viburnum.

In some cases of membranous dysmenorrhœa the practitioner will also find persistent leucorrhœa. In these cases give three times a day—

℞ Fluid ext. buchu,
Mur. tinct. ferri, aa ℥ii. M.

S.—Teaspoonful morning, noon, and night in wineglassful of water. Hot-water injection at bedtime, using hot water in large quantities, and an occasional dose of viburnum.

As soon as leucorrhœa is relieved withdraw the iron and buchu, and give the viburnum t. i. d. If patient is of scrofulous cachexia, give 10 drops syr. ferri iodide t. i. d. in combination with the viburnum.

I will briefly record a case or two of miscarriage that plainly show the value of therapeutic medication. These cases are to be divided into two classes: the first where there has been pain with muscular contraction, but no rupture of the membranes has occurred, and the fœtus is alive; the second where the membranes are ruptured or the fœtus is dead. I have already sketched my plan for preventing miscarriage; I will now name my remedy. My remedy is "hydrarg. cum creta."

I have found by long and ample experience that 10 grs. hydrarg. cum. creta will in all cases of a dead fœtus, or ruptured membranes retained in utero, or in many cases of protracted labor, act with more *promptness, power,*

and *certainty* than all the preparations of ergot or any other emmenagogues that I have ever crossed in a large female practice reaching nearly a half-century. I will state one or two cases. I could give many had I the time to do so.

Mrs. R., age 30, of nervo-bilious temperament, mother of three living children, in my absence from home four days ago, in the opinion of an old midwife, had a miscarriage. On my return home her husband came for me. When I reached her house I found her bathed in a cold, clammy perspiration, pulse 120, weak, unable to sleep, no desire for food, with a feeling of general *malaise*. I found the midwife in the room. To her I said, "Well, did you see the dead child and the after-birth?" "Yes, sir." "You think everything has come away, and the womb has cleaned itself well?" "Yes, sir." "Well, I must tell you for once you are mistaken, and I will soon show you that you are mistaken." I gave Mrs. R. 10 grs. hydrarg. cum creta, and, with watch in hand, took my seat to await developments. In just sixty minutes she had a movement of the bowels, accompanied with a strong uterine pain, and lo! the dead fœtus, about two and a half inches long, and the after-birth were both expelled by the single pain. Great was the old woman's astonishment when she saw she had mistaken "*clots*" of blood for the dead embryo and its membranes. This was not the first nor the last time I have seen this mistake made by the aged midwife. Gave Mrs. R. dose of Carlsbad salts in the morning, directed her to bathe her abdomen and uterine region with a strong infusion of eupatorium perfoliatum; inject hot water, with small quantity of chloride of lime in it, night and morning, and give fluid ext. viburnum prunifolium t. i. d., to be continued four days; convalesced rapidly.

S. B., mother of seven living children, is 42 years of age; has never before had any trouble in her confinements. I saw her the fifth day after her confinement, found her bathed in cold, clammy perspiration, pulse 110 and weak, unable to eat or to sleep, feels bad all over; had taken a dose of castor oil two days ago, but had no action; urine high-colored and scanty. Gave her 10 grs. of hydrarg. cum creta; in just two hours she had a movement from the bowels, accompanied by a strong pain, as strong as a labor-pain, and there came away a piece of after-birth the size of a silver dollar. Ordered her dose of Carlsbad salts next day; bathed stomach, over the womb, twice a day with a strong hot infusion of the eupatorium perfoliatum; washed out the vagina with hot water, with a small per cent. of chloride of lime in it, and gave fluid ext. viburnum perfoliatum t. i. d., to be continued five days.

A little over twelve months and I was called to this same woman on the fifth day after her confinement, found her in the same condition, and brought away again a piece of after-birth the same size by same remedy. Two years after this, and it was in her last confinement, I had to ride ten miles to see this same woman, on the same fifth day after confinement, and found her in the same condition. My treatment was a duplicate of my first two visits in every respect. Both of these women are living, have passed the age for child-bearing, and are hale, hearty women.

Here the question naturally arises, Why is the hydrarg. cum creta, a mild aperient, such a powerful promoter of uterine contraction? There undoubtedly is great sympathy between the muscles of the rectum, particularly the levator ani muscle, and those of the womb. The muscular contractions of the womb and its expulsive efforts are *nil* unless assisted by the co-ordinate action of the levator ani muscle. The *modus operandi* I conceive to be this: The crude mercury in the hydrarg. cum creta is a powerful, the most powerful known promoter of peristaltic action of the intestines. It exerts its effects through the *whole tract*, and per consequence, produces full, free, harmonious contraction of the uterine and intestinal muscular systems. Both of these muscular systems, acting in harmony and in unison, can exert an expelling force, which, "singly and alone," neither one is capable of. Drastic purgatives, as podophyllin, are not promoters of harmonious action between these muscular systems, but rather the reverse. I do not wish to be understood as saying that the hydrarg. cum creta is the only remedy or the only means of producing harmonious action between the intestinal and the uterine muscular systems, but I do say it is the most prompt, powerful, and certain promoter of concert of action between these two muscular systems. On the other hand, I have myself produced this same concert of action by different remedies and different procedures, and at different times, when contractions of the uterus are irregular. When vagina is hot and dry, I order 2 grs. antimonii et potassii tartras in 6 ozs. of water, tablespoonful every fifteen minutes, until emesis is produced. This will bring on harmonious action,

and often the child will be speedily born. Then, again, I have known when bowels were constipated, and the pains not regular or effective, by throwing into the rectum a salt-water injection, and by cleansing out the overloaded bowels, the equilibrium of the system would be restored, the two muscular systems brought in harmony, with the best of results. At another time ¼ grain sulph. morphine has accomplished the same result. Again, once or twice or three times in my long professional career I have found the patient suffering severely, but as soon as I arrived, and she knew it, she would become so well satisfied, so well contented, that she would become entirely free from pain, until, after a long, fair trial, I have had to make them uneasy by telling them I must go home, as I had stayed as long with them as I could do; pretend to start, to be called back, and labor completed in fifteen minutes. Again, I have succeeded by making patient mad, mad as a hornet, before this harmonious action would be developed, but I never lose sight of the fact that I want the rectum to *assist*.

The patient will often tell you that her bowels are sufficiently open; but as the child's head passes the superior strait, it is pressing before it a mass of hardened fæces: this will protract the length of the labor, and cause her longer and greater suffering. Some gynæcologists say, do not interfere with this, leave it entirely to nature, but I say, grease your finger, and inadvertently slip it into the rectum, and slowly and carefully pick out these masses; the labor will be shorter, easier, and you may prevent a vesico-vaginal fistula or a ruptured perineum by so doing.

(To be continued.)

METEOROLOGY.

By A. Comstock, M.D., Toledo, Ohio.

IN the matter of climate, as related to the medical profession, *guessing* is unsatisfactory, unscientific, and must be excluded. The advantage of climatic hygiene is recognized, and the necessity, though tardily admitted, must in many cases become an ultimatum. The fatal error, compounded in part from the indecision of the doctor and the patient, lies in the direction of inactivity and delay. In this country we have been particularly unfortunate till of late, because an ocean voyage lay between us and the springs or mountains or dry atmosphere found in parts of Europe, and our own resources were comparatively unknown. When not unknown they were largely inaccessible, for but recently have we been able to reach the Adirondacks, the mountains of North Carolina, the soft air of Florida, or the foothills of California and Colorado. There is a great variety of condition and adaptability to be secured, and, if properly investigated, it will soon be learned and appreciated.

Much has been written of late by medical authors, and much generalizing, together with much expansion of discretion. The tendency is to claim too much, and present the attractions of some thermal spring or lime-grove as a pain-killer of the widest latitude, or give it the status of a patent nostrum. The factors which go to make up the issue are the condition of the patient and the quality of the climate. So long as in the history of evolution man is an air-breathing animal, and so long as houses are badly constructed, and towns located for convenience of commerce regardless of anybody's lodging apartments, light, heat, drainage, and breathing space, so long will life be cheap and money dear. The great mass will continue to risk life and recklessly lose it, but some desire life, and will make the fight for it. In a monograph by Dr. William, in last July's *Sanitarium*, on "The Climatic Treatment of Phthisis," he comments as follows as to his notion of a first-choice resort in such cases: "It should possess a pure water-supply and adequate drainage; it should be of a dry and porous soil, and should be favorably situated with respect to neighboring heights and marshes and prevailing winds. It should be equable in temperature, and possess the maximum of pleasant weather. It should not be so hot as to be enervating, nor so cold as to prevent out-door exercise and proper ventilation of houses. It should afford plenty of amusements; it should not be crowded with consumptives, and it should be sufficiently unfashionable to admit of hygienic dress; should be sparsely populated and newly settled." To be out of doors, to be entertained, to be properly clad and fed, and sleep—for one-third of the time we must be in bed—are the staples. Climate that will do for some conditions and stages of phthisis will not be best for others, and that which will quiet and subdue a neurotic lesion may not be the place for a defective kidney; as also is the reverse true. A malarial diathesis must seek an environment that doubtless would not be suited to the victim of rheumatism.

What we require, in order to guide us and

advise our patients, is the *detail* of climatic symptoms, as we are presumed to know the symptoms of the case before us, and we desire that, rather than the opinion of any one man of any one locality in such cases, since we assume the responsibility.

Fully appreciating the justice of this line of thought, some of the profession in Colorado have been urging for years a systematic report from which an intelligent inference may be drawn. During the session of the Legislature preceding the present one, a charter was granted to the incorporators of the "Colorado Meteorological Association." Being without an appropriation, a voluntary effort was made by some of the medical men, aided by members of other scientific bodies, to fairly represent some varieties of climate in this interesting region. The work has been in progress for nearly one year, and includes observations from about twenty-five places. Some of the points are supplied with all the most approved instruments to note direction and velocity of wind, barometric and thermometric conditions, precipitate of moisture either by rain or snow, and humidity of the atmosphere, portions of the day when cloudy or clear sky is observed, etc. In the case of others, barometers and hygrometers are absent.

Where the United States signal stations are, observations are taken five times per day, and at all points not less than three,—namely, at 7 A.M., 2 P.M., and 8 P.M., from which the average mean is derived. The reports are sent to headquarters for each week, from which the monthly publications or bulletins are compiled. The present Director of Observations is F. H. Loud, Professor of Natural Science at the College of Colorado Springs. These reports will increase in value as an interval of time and wider observation follow, for the selection of points will be noted as well taken by reference to the chart of Colorado.

The elevations of the different observatories are in feet as follows: Alma, 10,300; Cañon City, 5344; Colorado Springs, 5992; Denver, 5294; Dodge City, Kansas, 2517; Durango, 6520; Fort Collins, 4900; Fort Lewis, 8500; Georgetown, 8500; Glenwood Springs, 5200; Golden, 5665; Hugo, 5068; Idaho Springs, 7500; Las Animas, 3899; Longmont, 5000; Montrose, 5825; Monte Vista, 7200; Pandora, 8700; Saguache, 7750; Santa Fé, 7026; Silverton, 9400; Trinidad, 6070; Westcliffe, 7800; Pike's Peak, 14,131.

The report for the month of November, 1886, is here appended to indicate the character of work and figures for that time.

The following table contains statistics of temperature (T) and rainfall (R) for the month of November in fifteen years:

Comparison of Different Years.

	Denver.		Colorado Springs.			Denver.		Colorado Springs.			Denver.		Colorado Springs.	
Year.	T.	R.	T.	R.	Year.	T.	R.	T.	R.	Year.	T.	R.	T.	R.
1872.....	33.7	0.69	30.4	0.26	1877.....	35.2	0.73	30.9	0.22	1882.....	37.4	0.71		
1873.....	41.1	0.16	39.2	0.00	1878.....	41.6	0.67	38.1	1.10	1883.....	42.9	0.32	38.1	0.00
1874.....	42.4	0.08	37.9	0.35	1879.....	38.4	0.21			1884.....	42.1	0.19	36.4	
1875.....	37.8	1.28	37.1	1.19	1880.....	22.0	0.83			1885.....	42.9	0.55	39.7	—
1876.....	37.5	1.50			1881.....	36.1	1.68			1886.....	33.2	1.93	32.9	0.19

The arrangement of the following tables (which refer to November, 1886, alone) is similar to that explained in previous bulletins. To the statistics of wind, in the first of them, may be added those for Colorado Springs, where the total movement was 7621 miles, and the mean velocity 10.6 miles an hour. Observation hours are expressed in Denver time:

	Mean barometer.		Wind.		Temperature.			
					Means at			
	Actual pressure.	Reduced to sea-level.	Total movement.	Mean velocity.	5 A.M.	1 P.M.	9 P.M.	Monthly mean.
Denver.....?	24.721	30.073	6,683	9.3	27.5	41.3	30.8	33.2
Dodge City, Kan.	.....	30.109	6,062	8.4	.....	.....	.....	38.1
Montrose	24.357	30.179	3,304	4.6	22.7	37.5	25.8	28.7
Las Animas	26.061	30.089	4,956	6.9	20.5	47.7	28.8	32.3
Pike's Peak	17.597	30.126	21,085	29.3	5.0	9.0	7.3	7.1
Santa Fé, N. M.	23.277	30.116	5,676	7.9	27.1	41.4	32.6	33.7

	Extreme temperatures.				Means of daily extremes.			Humidity.		Rain and snow.
	Highest.	Date.	Lowest.	Date.	Maxima.	Minima.	Maxima and minima.	Relative.	Dew-point.	
Colorado Springs	66.0	4	.....	17	46.1	20.9	33.5	.....	.....	0.19
Denver	63.0	4	— 6.0	17	45.5	20.4	33.0	61.3	19.1	1.93
Dodge City, Kan.	73.0	1	7.3	18	.....	.....	.....	65.3	25.7	0.24
Fort Collins	.....	...	— 6.0	17	.....	16.7	.....	71.9	21.7	1.18
Fort Lewis	59.0	6	— 13.0	17	41.2	15.4	28.3	.....	.....	1.30
Georgetown	49.0	7 & 8	— 3.5	17	35.8	22.3	29.1	.....	.....	0.85
Golden	64.0	4	— 10.0	17	44.5	20.9	32.7	.....	.....	2.82
Husted	67.0	4	— 13.0	17	44.7	14.1	29.4	.....	.....	0.25
Idaho Springs	55.0	4	— 7.0	17	41.3	23.0	32.1	.....	.....	.....
Las Animas	75.2	4	— 6.0	17	51.7	17.2	34.5	74.7	23.6	0.23
Montrose	56.0	6	— 18.5	17	42.1	15.6	28.9	65.9	18.0	0.54
Pandora	64.4	5	— 5.8	17 & 23	44.4	11.6	28.0	.....	... ..	.....
Pike's Peak	23.9	7	— 27.0	17	13.5	2.3	7.9	77.0	0.6	1.07
Santa Fé, N. M.	58.8	5	— 0.4	17	45.5	22.3	33.9	49.3	14.8	0.30

	Temperature.							Monthly mean.	Rain and melted snow.
	Extremes.				Means at				
	Height at 2 P.M.	Date.	Lowest at 7 A.M.	Date.	7 A.M.	2 P.M.	9 P.M.	½ [7, 2, 9, 9].	
Alma	42	7	— 8	17	13.6	26.9	17.3	18.8	0.74
Cañon City	68	4	10	17	32.5	48.7	36.0	38.3	
Colorado Springs	65.5	4	6	17	27.8	44.2	29.7	32.9	0.19
Durango	63	6	— 9.5	23	18.1	39.8	26.0	27.5	1.44
Fort Collins	64	4	1	12	24.8	41.1	26.0	29.5	
Fort Lewis	56	6	— 9	23	21.2	38.2	23.5	26.6	1.30
Georgetown	48	7	3.5	16	25.4	33.4	27.7	28.6	0.85
Glenwood Springs	57	7	3	18	22.4	40.9	26.4	29.0	
Golden	62	4	14	12	30.7	41.5	33.7	34.9	2.82
Hugo	60	30	0	17	26.5	39.2	28.6	30.7	
Idaho Springs	54	4	4	17	25.8	37.1	28.1	29.8	
Longmont	68	4	— 14	17	20.6	39.9	23.7	27.0	
Monte Vista	54	4	— 5	17	14.6	39.3	21.8	24.4	0.28
Saguache	57	6	— 1	17	17.2	41.2	23.1	26.2	0.45
Silverton	52	6	1	27	15.2	36.2	19.5	22.6	1.59
Trinidad	71	30	— 13	17	24.6	50.9	30.9	34.3	
Westcliffe	70	3	— 22	17	16.0	44.7	25.5	27.9	1.22

MURIATE OF PILOCARPINE IN URÆMIA.

By A. D. Bundy, M.D., St. Ansgar, Iowa.

THERE is nothing new either in the drug or in the use of the same in this short communication. But I wish to emphasize its great use and efficiency in cases of acute nephritis, where the suppression of the urine is nearly complete, and in which the patients are in extreme peril unless the kidneys can be temporarily relieved by prompt and free sweating. I know no remedy so efficient, prompt, and free from danger as pilocarpine. I have used it hypodermically in children with the best results, and no sign of injury, There are times in every practitioner's experiences when to have such a remedy at hand, and at the same time the boldness and knowledge to use it, is to tide a patient over a critical place until other remedies and means can be used to follow up its beneficial effects. One of such occasions is such as I have mentioned. When convulsions and coma have possession of such cases, time is almost wasted in pouring drugs into the stomach, even were it possible, or even injecting the same per anum. Pilocarpine, according to my experience, which is quite large, has done me and my patients royal service. It ought to be in the possession of every physician. The knowledge that it is used but little in the country is my reason for writing this.

USE OF THE ABDOMINAL BANDAGE IN THE SECOND STAGE OF LABOR.

By Cheves Bevill, M.D., Winfield, Ark.

IN the September number of the Therapeutic Gazette, 1886, page 599, is an article headed as the above, by Dr. J. Wesley Welker, of Stromburg, Neb. I have looked closely in every number since that for some one to say something on the same subject.

I hope that Dr. Welker will not be offended at what I say (such questions strictly belong to obstetric journals rather than the Gazette). I am satisfied that many young physicians who have read Dr. Welker's article will be badly disappointed in their expectations by the use of the bandage.

I have used the bandage regularly ever since April, 1877, and have found great benefit by its use in one class of troubles,—*i.e.*, anterior or lateral obliquity of the uterus. Meigs used it in his practice years ago. Cazeaux, in his great work on obstetrics, recommends it in cases of obliquity. On page 412 of the *American Journal of Obstetrics*, April, 1880, is to be seen an account of an "elastic bandage" used by Drs. Morton and Marcy. These gentlemen used it, and speak in high terms of its use in holding the "fundus down," and state that it "was a part of the obstetrician's armamentarium in the Middle Ages."

The main thing I wish to speak of is that Dr. Welker's cases were taken indiscriminately, without seeing whether it was necessary to use the bandage or not. Every physician of any experience has found scores of such cases as the doctor refers to. Now, if these cases are noticed closely, they will be found to be only natural cases of labor, not one word said about any obliquity of the uterus existing. I have seen many cases of labor that were completed in as short a space of time as is here spoken of. If the doctor had cited cases that had been in labor for several hours, and in which the os would turn back in the hollow of the sacrum when the pains came on, there would be more encouragement for the young physician to use the bandage.

I have used it in the second stage of labor in four cases in the last ten months, where the uterus would tilt over anteriorly, and had continued to do so for two or three hours before I applied any bandage. These cases were all women who had borne several children, and their abdominal muscles were relaxed, and this bandage was a great help to them in giving support to the back and abdominal muscles, and keeping the os in the line of the pelvic straits until the child's head would become engaged in the straits.

I wish all physicians would use the bandage in such cases. It would save the mother much pain and hasten labor, and would save the child in some cases. But it will not, according to my observations, work in every case as well as in the cases above referred to.

I saw a case a year ago where a child's life was lost, I am satisfied, by not using the bandage. The forceps were applied, and the child's head badly bruised by them. The physicians in charge said that the os would turn back in the hollow of the sacrum, and that the os was fully dilated. In such cases use the bandage, or any other contrivance. But let us not make doctors think that it will do in all cases as well as in such as above referred to.

The Therapeutic Gazette

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Leading Articles.

BROMISM.

THE series of phenomena known as bromism must be familiar to almost every active practitioner of medicine. Although, therefore, mild poisoning by the salt is very frequent, really serious symptoms are rare, and literature is almost bare of instances of death fairly attributable to poisoning by bromide of potassium. The only case in which death has been recorded as due to acute poisoning by the bromide of potassium is one reported by Küssner, in which a patient having been ordered to take daily 1 to 2 teaspoonfuls of a solution containing one hundred and fifty grammes of the bromide of potassium, took a teaspoonful hourly until during the second day, when he had used about half the mixture. Death occurred through the failure of the heart. We have known half an ounce of the bromide to be taken at a single dose with no evil results, and it seems very doubtful whether it would be possible to take life by a single dose of this salt, as any very large amount would be very apt to produce vomiting and rejection of much that had been swallowed. Cases of fatal poisoning by the continuous use of the drug are also excessively rare.

Dr. Hameau, of Bordeaux, reported in the *Journal de Médecine* of Bordeaux, March, 1868, the case of a young woman, aged 22, who had taken about four and a half pounds of the bromide of potassium in ascending doses during a treatment of ten months, and who, whilst in a condition of cachexia, with yellowish skin, a copper-colored exanthema upon the forehead, colic, gastralgia, insomnia, etc., was taken with delirium, profuse sweats, great prostration, followed by death in four days.

Dr. Anton Eigner, in the *Weiner Med. Presse*, Nos. 25 to 34, 1886, reports the case of a woman who took two and a half kilogrammes—about five pounds—of bromide in less than a year. On the 27th of September the woman was quiet, with pupils normal, except that they were slightly unequal, with the tongue heavily coated, gums swollen, some inflammation of the mucous membrane of the nose, gums, and teeth, and a heavy odor of bromism upon the breath. There was also a marked eruption of acne, distinct lessening of the sensibility of the gums, tongue, and fauces, general weakness, and much pain in the forehead. When movements were attempted with the hands there was a distinct tremor, but the woman was still able to walk, though with some tendency towards staggering. Some hours later excitement came on and soon passed into delirium, the patient getting out of the bed, wandering around with short steps, feeling for something with her trembling hands, suffering from hallucinations of sight and hearing, and complaining bitterly that she was being poisoned. This condition lasted, with some ameliorations and exacerbations, from the 28th of September until the evening of the 1st of October, when death occurred. At the autopsy, pronounced bronchitis and lobular pneumonia of the lower lobe of the right lung were found; but the brain, meninges, and spinal cord revealed no abnormality even to the microscopic examination. It is very probable that the excessive amount of bromide of potassium taken had in this case something to do with the death, by predisposing or possibly producing the bronchitis and the pneumonia, yet, although the mental disturbance is affirmed to have preceded the coming on of the lung-trouble, doubt must remain whether the case ought to be considered one simply of death from bromism. It has not been long since it was shown in an editorial in this journal that in some cases the cerebral symptoms overshadow the ordi-

nary signs of pneumonia. It seems probable that in the case reported by Dr. Eigner the pneumonia was not detected at its onset. The delirious excitement is more like the ordinary cerebral nervous symptoms of the so-called cerebral pneumonia than it is like the apathy of depression, the gradual burying in oblivion of all the cerebral functions, which is characteristic of typical bromide-poisoning.

PATHOGENETIC THERAPEUTICS.

ON the evening of February 7, Dr. Harold C. Ernst, of the Medical School of Harvard University, read before the Philadelphia Academy of Surgery an account of the experimental research upon rabies which he has made during the past six months. The report bore upon its face every evidence of careful, clean-cut, scientific work, and, so far as one can judge from the hearing of a paper, was conclusive in its results.

Dr. Ernst did not use the virus of "street rabies," but one which he obtained from the laboratory of Pasteur. His labors seem to prove that this Pasteurian virus, when introduced either hypodermically or under the dura mater, causes a definite disease, with a period of incubation averaging from seven to twelve days, but in very rare cases as short as three, and in others as long as twenty-three days; that it especially abounds in spinal cords of animals poisoned with it; that it is capable of preservation for many months by the freezing of the cord, but loses its intensity by being slowly dried; and that if an animal which has been poisoned by the active virus be subsequently inoculated a number of times by impaired or weakened virus, fatal illness is avoided. This, of course, does not prove that the inoculation of this virus would be effective against true street rabies, because it still remains a matter of doubt whether or no the Pasteurian virus is that of true rabies, although the resemblance of the diseases produced by the Pasteurian virus to street rabies and the assertions of Pasteur, of course, render highly probable that his virus is a modified street rabies virus. Dr. Ernst quoted the work of M. D. Frisch, of Vienna, as confirmatory of his own results and of those previously obtained by Pasteur. At this writing the full memoir of M. de Frisch has not been published, and the Vienna correspondent of *La Semaine Médicale* asserts in the number which has just reached this country, that although M. de Frisch found that the Pasteurian virus would protect the animal from itself, it failed in every case in which the original poison was taken directly from a case of street rabies. It is perfectly evident that the scientific battle now rages just about this point, and that the Pasteurians, before their results can be accepted, must prove that the disease produced by the Pasteur virus is active against true street rabies. It is a most unfortunate circumstance that the loose and excessive talking, and the broken, tumultuous manner of reporting his work, which seems to be inherent to the constitution of M. Pasteur, prevents any one from knowing with certainty where he did get his original virus. We suppose, however, that a great genius, such as M. Pasteur undoubtedly is, can only work in accordance with his own nervous organization, and the world must be thankful for what is achieved.

Out of the uncertainties this truth *appears* to emerge, namely, that an animal which has been poisoned by an active virus can be prevented from sickening and dying by frequent subsequent inoculations with the same virus in a weakened or impaired state of activity. To us this is astounding, because it apparently involves the recognition of a new law or principle in therapeutics! A law or principle which has been previously asserted by various crack-brained practitioners of medicine, whose half-witted condition gave to them that imaginative foresight which the common people attribute to a "natural," but whose complete lack of scientific brains prevented from establishing or even rendering probable their imaginative speculations.

Since the days of Jenner it has been known that the inoculation with vaccine matter will prevent the development of smallpox. The theory has always been that a zymotic disease destroys in the system something upon which it feeds, and thereby protects from a second attack. Vaccination has been supposed to destroy in the human system the sustenance of smallpox virus, and thereby prevent the development of the disorder. In the case of hydrophobia, however, the inoculation is practised after the poison has been received into the system, and during a time when the disease really exists, for it is absurd to suppose that the system is not diseased until symptoms break forth. There must be during the period of incubation a progressive alteration of nutritive processes, which only manifests itself in gross symptoms when it has reached a certain intensity. Is it possible that in the

case of the reinoculation with Pasteurian virus organisms are rapidly developed in the system, which are nearly free from toxic properties, and still have the power of destroying that which feeds the more dangerously active entity? Whatever may be the explanation of this newly-discovered principle or law governing the removal of diseases, the thought at once occurs that its power does not simply apply to hydrophobia, but probably dominates the so-called zymotic diseases, or, in other words, all diseases which are dependent for their existence upon the presence in the blood of an organism. If this be so, the smallpox poison, the virus of scarlet fever, the toxic agent of typhus and typhoid fevers, etc., are to be fought each by itself in an altered form, and the day seems approaching in which in these diseases we shall be able not merely, as at present, to alleviate the symptoms but to strike at the very *fons et origo mali*.

FAITH-CURE.

WE have never discussed the subject of faith-cure in our columns because the matter has always seemed to us outside of the domain of rational therapeutics. Any physician who could be swept off his feet by the torrent which flows so tumultuously, although in a narrow and popular channel, could scarcely be influenced by any scientific discussion of the subject.

We are very glad, however, to call the attention of our readers to a discussion of faith-cure in the *Century Magazine* for the month of March. There are two articles, one by Mr. R. Kelso Carter, which is an apology for believers in the doctrine, and another by the Rev. Dr. Buckley, editor of the *Christian Advocate*, who writes very cogently and sensibly. We quote a few paragraphs from him, and trust that our readers will call the attention of any of their clients who may show symptoms of this madness to the article:

"It is a means of obtaining money under false pretenses. Some who promulgate these views are honest, but underneath their proceedings runs a subtle sophistry. They establish institutions which they call faith-homes, declaring that they are supported entirely by faith, and that they use no means to make their work known or to persuade persons to contribute. Meanwhile they advertise their work and institutions in every possible way, publishing reports in which, though in many instances wanting in business accuracy, they exhibit the most cunning wisdom of the children of this world. . . .

"The horrible mixture of superstition and blasphemy to which these views frequently lead is not known to all persons. I quote from a paper published in Newark, N. J., in the interest of faith-healing:

"'DEATH.—Three of the richest men in Ocean Park, N. J., have died. Faith-healing has been taught in the place, but was rejected by them, so death came.'

"'CHARLESTON, S. C.—A few years ago the Holy Ghost sent me to preach in that city. But they rejected the gospel and me. A wicked man shot at me and tried to kill me, but God saved me so that I was not harmed. . . . But I had to leave Charleston, and do as the great Head of the Church said, . . . "When ye depart out of that house or city, shake off the dust from your feet." Earthquake, September 1, 1886; one-half the city in ruins. It has a population of about fifty thousand people. Ye wicked cities in the world, take warning! God lives!'"

MINERAL SPRINGS OF THE UNITED STATES.

THE number of people freighted with their loads of dollars who travel from these United States yearly to the fountains of healing waters which gush forth from the rocks of Central Europe is not a few. It is to be expected that on a continent which boasts of two great ranges of mountains and also immense masses of every known geological strata, mineral springs would abound. We confess, however, that before looking over the Thirty-second Bulletin of the United States Geological Survey (written by Dr. A. C. Peale, and just issued from the governmental printing-office at Washington) we had little idea of the vast numbers of thermal springs in the United States. It is perfectly plain that the only excuse American physicians have for sending patients abroad, so far as natural waters are concerned, is to be found in our ignorance of the exact constituents of our own native mineral springs, and in the lack of proper hotel accommodations at the springs.

Hitherto the fullest published list of our mineral springs has been that compiled by Drs. William Pepper, H. I. Bowditch, and associates, and published in 1880 in the thirty-first volume of the "Transactions of the American Medical Association." It enu-

merates about 500 localities. In the compilation of Dr. Peale, 2822 localities of mineral springs are mentioned. In the Northern Atlantic States there are 405 localities and 637 individual springs; in the Southern Atlantic States, 371 localities and 1048 individual springs; in the Southern Central States, 1201 localities and 1911 individual springs; in the Northern Central States, 601 localities and 1276 individual springs; in the Western States and Territories, 722 localities and 3949 individual springs; making a total of 8821 springs. But a small proportion of this immense number of waters has been analyzed. Thus, out of the nearly 4000 known mineral springs in the Western States only 132 have been studied by the chemist, and only 18 have been used as health resorts.

The more the subject is examined, the greater is the contrast between our actual knowledge of our mineral waters and the apparent riches of this continent. In Wyoming alone, with its 2246 springs, the larger proportion of them thermal, only 7 waters have been analyzed. It would appear that almost every possible water is represented within the mere limits of the National Park.

THE DIGESTIVE FERMENT OF CARICA PAPAYA.

WE have recently had put into our hands samples of Finckler's papoid, which is said to be a digestive ferment prepared from the Carica papaya, or paupau-apple. In order to discover whether this substance is really of any value as a food ferment, we placed it in the hands of Dr. Samuel G. Dixon, who, in the Chemical Laboratory of the University of Pennsylvania, made the following tests of it:

TEST NO. 1.

1 gm. of fresh fibrin.
$\frac{1}{10}$ gm. of papoid.
50 c.c. of water.
Temperature, 90° F.
Time, 12 hours.
Result, little or no digestion.

TEST NO. 2.

2 small pieces of coagulated egg albumen, with about 10 times the volume of papoid and 50 c.c. of water.
Temperature, 80° F.
Time, 12 hours.
Result, about $\frac{1}{3}$ of albumen broken up.

This test was continued for twelve hours longer, with little or no additional digestion.

TEST NO. 3.

70 mg. of dried fibrin.
10 mg. of papoid.
50 c.c. water.
4 drops of HCl.
Time, 6 hours.
Result, unsatisfactory in the extreme, little or no fibrin broken up.

These tests were sufficiently accurate and careful for practical purposes, and demonstrate the uselessness of any further experimentation with commercial papoid.

AN INVESTIGATION OF PASTEUR'S METHODS.

AMONG the critics of Pasteur none have excited more interest than Von Frisch, of Vienna. He was sent by his government to Paris to learn the details of the method, and on his return he repeated many of the experiments of Pasteur, and has studied the subject of hydrophobia critically. His conclusions from work done during 1886 are embodied in his statement to the Vienna Academy of Sciences, and we abstract them from the *Medicinisch-Chirurgische Rundschau* for February 1, 1887. His statements are in the form of conclusions drawn from experimental work, and are as follows:

The poison of hydrophobia exists in its most concentrated form in the central nervous system (brain and spinal cord) of the animal poisoned.

Small amounts of cerebro-spinal substance, taken from a dog poisoned with hydrophobia and injected into another animal subdurally by trephining, call forth, after a latent period which varies but slightly (fourteen to twenty-one days), the same disease with absolute certainty.

From this source rabies is capable of being conveyed in a similar manner to other animals.

After subdural injection with portions of the marrow of men who died with rabies, animals become ill with the same symptoms, and after an equal time of incubation. From this fact the identity of the process in men and animals seems perfectly established.

After the subcutaneous injection of cerebro-spinal matter, the infection is less certain and the time of incubation is longer than after subdural injection of the virus.

The quantity of virus injected subcutaneously is in inverse ratio with the length of the period of incubation; the less the amount

injected, the longer the incubation period required.

Through successive subdural inoculations of cerebro-spinal substance containing the virus of rabies there resulted after a succession of generations a shortening of the time of incubation, which occurred at first very irregularly, then more regularly, and finally in decreasing length.

The fixed virus obtained from Pasteur, which was derived from the successive inoculation of forty to fifty generations of virus, and said to have seven days as a time of incubation, excelled the virus of "street rabies" in intensity, not only in that the disease appeared sooner, but also that the animals inoculated, whether by the subdural or subcutaneous method, acquired the disease *without exception.*

The virus of Pasteur appeared, when transferred through successive generations, to have no appreciably shorter time of incubation (animals were sometimes made ill on the sixth day), while the period was not constant at seven days, but was sometimes extended to ten, and even twelve days. The transference of "street rabies" virus for two or three generations resulted in an incubation period of from eight to twelve days, and a virus of equal intensity with Pasteur's laboratory virus.

A virus like that of Pasteur with an incubation period of seven days can be obtained not only by his method but also by a series of transfers, which bring it much earlier to its potency, and this virus shows itself very constant in its effect and period of incubation.

Drying the cerebro-spinal substance at 20° C. over caustic potash greatly diminishes the virulence of the matter, and after fourteen to sixteen days of such treatment its power has entirely gone.

Animals for experiment which were inoculated with progressively diluted virus subcutaneously, were protected by this from the action of stronger virus, provided that the series of injections of progressively stronger virus did not follow each other too rapidly.

In contradiction to Pasteur's statement, animals inoculated for ten days with virus increasing in strength, but subcutaneously administered, were not proof against "street rabies;" it was only when the inoculation was subdural that immunity was sure.

Rabbits and dogs which, after subdural inoculation with "street rabies," were treated by the prophylactic inoculation given subcutaneously, were seized with rabies.

Pasteur insists that prophylactic inoculation should not be delayed too long, but Von Frisch has followed his method in detail. Pasteur recommends the inoculation of an animal within twenty-four hours, repetition every two hours, and a repetition of the series of inoculations, two or three times, while the prophylactic inoculation should begin at once after infection, at least on the following day.

Experiments conducted after this plan on dogs and rabbits gave no good results; the animals developed rabies even after this energetic treatment. These experiments showed, however, a fact of value: that the rapid repetition of inoculation with material of increasing intensity did not result in protection by the weaker virus against the stronger which followed it. Among a number of rabbits and dogs upon which were performed "control experiments" to test these conclusions, and on which the intensive inoculation without previous infection was made, a very large proportion developed rabies and died with it even when the time of incubation reached thirty-four days. From these experiments the conclusion is reached that more researches upon animals must be made before reliable results can be obtained, and that we have no reasonable ground for treating human beings by prophylactic inoculation after bites while the strong probability exists that through the prophylactic inoculation, at least through Pasteur's method of intensified inoculations, the disease itself may be communicated.

TREE-PLANTING.

THE THERAPEUTIC GAZETTE is a welcome visitor to so many country firesides, and the subject of tree-planting is so closely connected with the health and prosperity of country districts, in which the medical man is looked up to as an authority upon all sorts of subjects, that we do not hesitate to occupy a few lines with calling attention of our readers to the importance of tree-culture in the United States. On the eastern and western edges of the continent nature has provided a sufficiency of forests, which are, however, in danger of rapid destruction through the hands of man. In the centre of the continent, where nature is at fault, man should reverse the process of destruction. In our opinion, neither preaching nor the hope of sanitary good, nor the love of the æsthetic, have sufficient power to move large bodies of men. The glitter of the guinea will, however, always draw, and it is therefore with great

pleasure that we read in *Science* of March 4 that the farmers of Massachusetts have learned that cultivated forests may yield a very profitable result, and that it has been demonstrated in Barnstable County, Mass., that a crop of pitch-pine can be raised from seed with as much certainty as a crop of corn, and with much less expense. In the barren, sandy, exhausted soils of Middleborough and Bridgewater white pine has been so successfully cultivated that farmers have sold logs at the rate of one hundred and fifty dollars an acre from seedlings set by themselves.

The National Agricultural Department ought to institute a series of experiments on a large scale to determine what species of trees can be most profitably cultivated in the various diverse climates of this country. Professor C. S. Sergeant, of Harvard College, states as a result of experience that he has entirely changed his opinions in regard to the comparative value of foreign and native trees. For years the imported trees were very largely planted out in New England, and at first grew rapidly and strongly, so that they were thought to be better than the native species; but all of them, as they approach maturity, cease growing, become decrepit, and fail to produce good timber. Perhaps from the list of foreign failures the willow should be excepted. Its value is not in affording timber but in producing wood adapted to peculiar purposes, such as charcoal and basket-making.

YELLOW FEVER INVESTIGATIONS.

BY the passage of the Sundry Civil Appropriation Bill, Congress has authorized the President to expend a sum not exceeding ten thousand dollars for the purpose of investigating the merits of the methods practised in Mexico and Brazil for preventing yellow fever by inoculation.

In such an inquiry everything depends upon the person selected. For the position Dr. Sternberg, of the United States army, is certainly prepared by his thorough training in bacteriology and by his having had yellow fever. Prof. John Guitéras, of Charleston, a native of Cuba, well known by his acute articles upon tropical fevers, having had great clinical experience, speaking Spanish, and bearing about with him the immunity to yellow fever which belongs to his race, would afford a complementary companion to Dr. Sternberg. We commend the pair most heartily to the notice of President Cleveland.

Reports on Therapeutic Progress.

MORPHINE IN DIABETES.

In the *Practitioner* for January, 1887, DR. J. MITCHELL BRUCE publishes an account of a series of investigations which he has made as to the effects of the administration of morphine to cases of diabetes mellitus. These investigations of Dr. Bruce throw considerable light not only on the mode of action of morphine in diabetes but on the pathology of the disease itself. His method was first to ascertain the amount of sugar passed by the patient on an ordinary mixed diet; that is, allowing him to continue the same kind of food as he had been consuming when he was taken into the hospital. The patient was then placed on a strictly antidiabetic diet; having by this means reduced the sugar to something like a constant minimum, morphine was administered by the mouth, beginning with a moderate dose, and increasing the quantity by small increments as long as the glycosuria continued to yield to the drug and unpleasant symptoms were not developed, until if possible a still lower constant of sugar was reached. In this stage of the treatment hypodermic administration of the morphine was substituted for its exhibition by the mouth; thus serving to determine as to whether there was any difference in the effect of morphine on the amount of sugar passed in the urine, according as on the one hand it was allowed to pass through the liver entirely, or, on the other hand, it discharged into the general circulation, thus mainly escaping the hepatic system.

The conclusions which Dr. Bruce feels warranted in drawing from these observations he arranges under two heads.

I. *Therapeutical.*—There can be no question that in this case morphine was of value in the treatment of diabetes. Not only did the sugar disappear entirely under the use of the drug, but the patient's weight increased four and a half pounds during the first course of morphine by the mouth, and his personal condition, subjectively and objectively, was greatly improved. It is true the improvement was but temporary; but it would be equally correct to say that the benefit continued as long as the treatment was maintained. Dr. Bruce thinks that in the treat-

ment of diabetes morphine has suffered somewhat unfairly in reputation by comparison with codeine.

II. *Physiological and Pathological.*—1. In the case before us *the glycosuria was proved to be due to an increased income of sugar into the blood; not to diminished destruction of sugar in the system.* This conclusion was established by the fact that whilst the glycosuria was controlled by morphine, the drug had very much less influence on the disorder when it was thrown into the general circulation (where destruction of sugar is accomplished) than when it was introduced into the *portal* circulation.

2. In the present case *the increased income of sugar was proved not to originate in simple transportation of sugar from the intestine or portal vein to the general circulation.* When all saccharine and amylaceous materials had been removed from the diet, the patient continued to excrete as much as 1360 (later on, even 4000) grains of sugar per diem. It was clear, therefore, that glycogenesis was still active, and that the sugar was derived from the nitrogenous constituents of the food by some organ, whether the liver situated on the portal circulation, or the muscles and other viscera, situated on the general circulation.

3. *The excessive glycogenesis that was going on in this case was proved to be effected mainly or entirely in the liver, not in the muscles or any of the other viscera.* This conclusion followed from two facts: (1) that when the morphine was introduced into the liver by the portal vein, it reduced the sugar to *nil*, whilst it did not materially affect the other viscera, such as the central nervous system; and (2) that when it was introduced into the general circulation it diminished the amount of sugar excreted only to the degree that might have been anticipated from the portion that would reach the liver through the hepatic artery, whilst it markedly affected the other viscera, such as the central nervous system.

4th and lastly, these results appear to prove that in this instance, if the diabetes was of nervous origin (as it is believed to be in some cases) the seat of the disordered process was in the liver, not in the central nervous system or nerve-trunks. This conclusion again follows from the effect of morphine by the mouth as compared with its effect *sub cute;* for the subcutaneous method distinctly proved that whilst the central nervous system was profoundly depressed by morphine, there was but little effect on the glycosuria,—through this channel, probably *none.*

THE ANTISEPTIC TREATMENT OF SUMMER DIARRHŒA.

In the *New York Medical Journal* for January 29, 1887, Dr. L. Emmett Holt publishes an elaborate paper on the antiseptic method of treatment of summer diarrhœa, from which he draws the following conclusions:

1. Summer diarrhœa is not to be regarded as a disease depending upon a single morbific agent.

2. The remote causes are many, and include heat, mode of feeding, surroundings, dentition, and many other factors.

3. The immediate cause is the putrefactive changes which take place in the stomach and bowels in food not digested, which changes are often begun outside the body.

4. These products may act as systemic poisons, or the particles may cause local irritation and inflammation of the intestine.

5. The diarrhœal discharges, *at the outset* at least, are to be looked upon as salutary.

6. The routine use of opium and astringents in these cases is not only useless, but, in the beginning particularly, they may do positive harm, since, by checking peristalsis, opium stops elimination and increases decomposition.

7. Dr. Holt does not deny nor undervalue opium in many other forms of diarrhœa than the one under discussion.

8. Evacuants are to be considered an essential part of the antiseptic treatment.

9. Experience thus far leads the author to regard naphthalin and the salts of salicylic acid as the most valuable antiseptics for the intestinal tract.

ANTIFEBRIN.

Eisenhart, in the clinic of Ziemssen in Munich, has used antifebrin, and reports as follows: The number of cases observed was thirty. The doses given were from 4 to 8 grains, given in powder and solution, by rectal and anal use. In a case of erysipelas a dose of 8 grains was vomited when given by the mouth; when given by injection it was retained.

In general the drug was well borne; half of the patients had a profuse perspiration following, and an exanthem occurred in one case.

Cases of typhoid, treated with antifebrin, had an easy course. The influence of the drug was generally manifested two hours after it had been taken. After a dose of 4

grains the temperature sank six times from one-tenth to one degree, thirteen times from one to two degrees, fifteen times from two to three degrees, six times from three to four degrees, and three times more than four degrees. After a dose of 8 grains a depression of temperature of one-tenth to one degree occurred three times; from two to three degrees, seven times; from three to four degrees, twice; from three to more than four degrees, twice. In a few cases only was this effect wanting.

In comparison with antipyrin it was found that one-fourth as much antifebrin as antipyrin was required for a given effect. The conclusions of the observer were that in doses of 4 to 8 grains antifebrin was a very valuable febrifuge, reasonably certain of success. —*Deutsche Medizinal-Zeitung*, December 23, 1887.

THE DETECTION OF COCAINE IN THE ANIMAL BODY.

HELMSING, of Dorpat, has published a carefully-prepared pamphlet reporting his experiments on this subject, and his conclusions we find to be as follows:

The method employed in testing for cocaine was that of Dragendorf, and consisted essentially in acidulating the fluid containing the poison with sulphuric acid, and shaking the mixture with petroleum ether, benzine, and chloroform. The residue after each shaking was put in a watch-glass, and a drop of potassium iodide and picric acid added. The residue left after evaporating these mixtures gave no reaction for the alkaloid until it was rendered alkaline, when it was again shaken with the three volatile liquids, and evaporation again performed, when the residue gave with potassium iodide a brilliant red precipitate, and with picric acid a white precipitate.

Quantities of the alkaloid ranging from $\frac{1}{65}$ and $\frac{1}{180}$ of a grain were detected in urine; in blood the same amounts gave appreciable reactions; in food-stuffs, traces of the drug were found in the stomach after its administration.

Cocaine was found in the urine in the case of a cat to which $\frac{1}{7}$ of a grain of cocaine had been given. The same animal received $\frac{1}{3}$ of a grain, and both fæces and urine gave reactions for cocaine. A second animal which was made the subject of experiment showed the same reactions. An animal which was poisoned by 1¼ grains of the alkaloid passed urine and fæces twice, at intervals of twenty-six hours. In the excreta voided first well-marked reaction for the poison was observed; in the second, no trace of the drug was found. In the case of another animal which was poisoned by the same dose, and voided urine in three portions, at intervals of nine and fifteen hours, the quantity of cocaine excreted steadily diminished until none could be detected. The following organs and tissues were examined in an animal poisoned by ⅓ of a grain: heart and blood, lungs, spleen, liver, gall-bladder and bile, kidneys, stomach, small intestine, large intestine, brain, muscles, bladder with the urine. In the greater portion of these organs no cocaine could be found.

The dose was then increased to 4½ grains in the case of another animal, and the potassium iodide test gave reactions for cocaine in all the organs examined. A fatal dose of 1½ grains could be detected in but a portion of the organs after death. It is interesting to note that the largest dose given was discoverable in all the organs of the body, and the smaller dose of 1½ grains was found only in the liver, bladder, and urine. The elimination of the poison begins in twelve minutes after taking, when it was found in the urine; the bowels share also in excreting it. The writer adds a full list of the reagents which act upon cocaine, and a description of its lethal effects.

A SPEEDY CURE OF WHOOPING-COUGH.

MOHN, a Norwegian physician, had in his own family a case of scarlatina and whooping-cough. After the violence of the scarlatinal attack had subsided, but while the whooping-cough was still present, Mohn disinfected the child's bedding with the fumes of sulphur. Just previous to the fumigation the child had a severe paroxysm of coughing, which led the father to hesitate in his employment of the sulphur. He was surprised and gratified, however, to observe that the disease was cured; and the patient's sister, who had a cough, the sequela of pertussis, was also cured. These children were not included in the fumigation intentionally, but inhaled such vapor as casually permeated their apartment.

In a subsequent severe case, the writer, after the failure of other means, had recourse again to inhalations of sulphur gas, with prompt success. He cites successful cases of five months in age, and children of varying ages have been cured in this manner. He proceeds as follows: The patients are dressed in clean linen, and taken from their bedroom to another room. In their absence bedding, fur-

niture, playthings, linen, clothing, everything which the sick-room contained is so arranged that the fumes of sulphur can penetrate to all. Six and a half drachms of sulphur per cubic metre of air-space in the room are burned, and the fumes allowed to permeate the room for five hours. At evening the child is taken back to the sick-room and put in a bed which was disinfected; it awakes the next morning cured.—*Revue Internationale*, No. 35.

GELSEMIMUM ALKALOIDS.

In an elaborate paper Mr. F. A. Thompson describes (*Pharm. Era*, January, p. 3) two alkaloids obtained by him from gelsemimum root, thus confirming so far Messrs. Ringer and Murrell's hypothesis that the root contained two alkaloids, one of them exercising a paralyzing and the other a tetanizing influence. The alkaloids were obtained by percolating the finely-powdered root mixed with freshly-slaked lime with alcohol, shaking the percolate with chloroform, and then treating the chloroform solution with water acidulated with sulphuric acid. The separation of the alkaloids is effected by the addition of hydrochloric acid, the hydrochlorate of one of them, which is crystalline, being insoluble, and that of the other, which is amorphous, being soluble in its own weight of water. The crystalline alkaloid, for which Mr. Thompson proposes to retain the name "gelsemine," gave upon analysis results corresponding with the formula $C_{34}H_{60}N_4O_{12}$, differing, therefore, considerably from that attributed by Mr. Gerrard to the alkaloid analyzed by him (*Pharm. Jour.*, 37, xiii. 641). The amorphous alkaloid has not yet been obtained sufficiently pure for analysis.—*The Pharmaceutical Journal and Transactions*, January 29, 1887.

THE SUBCUTANEOUS INJECTION OF THE YELLOW OXIDE OF MERCURY IN SYPHILIS.

Szadek has made clinical studies with this mode of treatment in the clinic for dermatology at Kiew in the treatment of secondary syphilis. He made thirty-five injections in six patients, and selected the gluteal region, where he injected the drug deeply beneath the muscular fasciæ.

His formula was the following:

℞ Hydrarg. oxydat. flavi, gr. xv;
Gummi Arabici, gr. xx;
Aquæ destillatæ, ℥viss. M.
Fiat emulsio.

His conclusions from these observations were that (1) the local reaction was very little, even less than after the use of calomel; the patient generally complained of dull pain, which ceased in a few hours; the gluteal region was not tender on pressure in two or three days after injection; hemorrhage never followed these injections.

2. In no case did an abscess form, either at the point of injection or in its vicinity; generally a small amount of infiltration was observed; in one case only, on the third day after five injections, a painless node was felt in the muscle, which soon disappeared.

3. The examination of the urine showed, after each injection, the presence of mercury. —*Deutsche Medizinal-Zeitung*, January 10, 1887.

A NEW METHOD OF SEWER VENTILATION.

A new proposal has just been brought forward for the ventilation of sewers. It has the merit of originality and ingenuity. Mr. R. S. Ash has patented a system of ventilation by the force of concussions resulting from explosions automatically produced. In the man-hole of a sewer, or in the ventilating-shaft of a coal-mine, etc., he places a small cylinder where coal-gas accumulates till it reaches a little hole, and there comes in contact with a jet burning outside. An explosion results and the lid of the cylinder is blown off, but counter-weights make it fall back in its place, so that all is ready again for the next explosion. Of course the air is blown out of the man-hole, and a vacuum created and filled by the air rushing up from the sewer, but this displacement is not the principal merit of the process. A ventilating fan or revolving wheel and a furnace will equally produce a current of air; but such current generally travels down the central and main sewers, and leaves almost untouched the accumulations of foul gas in the branch sewers, in the angles, and in other inaccessible places. A shock, however, does not travel in a straight line, but spreads out in a circle. A stone thrown into a pool of water affords the readiest illustration of this fact. Let the edges of the pond be jagged and angular, the ripple will travel up every little crevice or opening in the banks. A current, on the other hand, even the current of a rapid stream, leaves quiet nooks made by the recesses of the embankment, where a boat may be safely moored without risk of its being borne away. Thus, an explosion in a

sewer will with more certainty move the air in the branch sewers and out-of-the-way passages than will a strong current down the main channel. Also it should be noted that it is precisely these branch pipes and sewers which are nearest to the inside of the dwelling, and therefore most urgently need ventilation. Consequently, if ventilation by concussion or explosion can be made to act without involving too great an inconvenience and expense, it is likely to prove as valuable a progress in practice as it is an advance in theory. —*The Lancet*, February 12, 1887.

ANTIPYRIN IN HEMICRANIA.

UNGAR, of Bonn, was led by the similarity of action of antipyrin with salicylate of sodium to try the former in hemicrania. He found that when given in the beginning of the attack or in the prodromal period the drug either wholly prevented an attack or made it very much milder. Patients who were generally not able to be about during an attack were able, after taking it, to maintain their usual avocations. When taken after the paroxysm of pain had fully established itself, it was still able to prevent a severe onset. Antipyrin is not, however, a reliable drug in all headaches. Patients were found upon whom it had no effect; it was more rarely found that the same patient was relieved on one occasion and not on another. A reason for this variation, and a means of recognizing it, the writer had not discovered. In cases which were relieved by antipyrin, for adults a dose of 15 grains, taken without repetition, was generally sufficient; rarely 23 grains were needed, and without repetition. The good results were generally manifested in an hour after taking; when this was not the case a similar dose was added, when in several cases the desired effect followed. Antipyrin was usually prescribed in capsules or wafers.—*Medicinisch-Chirurgische Rundschau*, February 1, 1887.

HYDRASTIS CANADENSIS IN UTERINE HEMORRHAGE.

DR. REYNOLD W. WILCOX reports in the *New York Medical Journal* for February 19, 1887, forty-three cases of various forms of uterine hemorrhage in which he has employed the fluid extract of hydrastis canadensis in doses of 20 drops three or four times a day in a wineglassful of water. The cases included cases of fibro-myomata, sub-involution, and hemorrhagic endometritis, in which the drug was administered continuously, while in other cases of hemorrhage at the menstrual period he has administered it for ten days before and during this period. He has never used hydrastine and the other alkaloids through his want of confidence in the constancy of their strength.

His conclusions supplement the results of treatment by other writers. He finds that hydrastis checks the bleeding from uterine hemorrhage by the production, he believes, of persistent anæmia, unaccompanied by the distressing cramps or the flooding from the alternate contractions and relaxations so often produced by ergot. Its use is therefore preferable in the case of small fibroids, where their expulsion would probably be attended by hemorrhage or septicæmia. In fungous endometritis, even when curetting has failed to arrest the bleeding, he has obtained remarkable results from the use of hydrastis.

TESTS FOR THE PURITY OF COCAINE.

HARTGE gives the following as practical tests of the purity of cocaine:

1. When heated upon platinum it must disappear without residue.

2. Solutions of cocaine must be of neutral reaction.

3. Sulphuric acid, when added, should not discolor its solution.

4. When to a solution of cocaine, 1 to 200 or 1 to 500, one drop of a two per cent. solution of potass. permanganate is added, the liquid should become red but remain clear. If the permanganate is added in drops beyond this point, a red precipitate of cocaine will fall, which will become brown on heating, but will give no odor of bitter almonds.

The writer tested six samples of cocaine, finding only one pure.—*Der Pharmaceut.*, January 15, 1887.

HYOSCINE IN KIDNEY-DISEASES.

In the *Practitioner* for February, 1887, DR. NESTOR TIRARD reports the case of a man, aged 58, suffering from chronic kidney-disease, in whom obstinate sleeplessness formed one of the most rebellious symptoms. For a time this condition was relieved by moderate doses of chloral and bromide of potassium, but this combination gradually lost its effect. After a time the tincture of cannabis indica was employed, but the result was disappoint-

ing; finally the hydriodate of hyoscine was employed in the strength of one grain to two hundred minims of distilled water, of which 2 minims were injected subcutaneously. This injection produced sleep, but constant wandering delirium, which increased with the repetition of the dose until the quantity was reduced one-half. The result was, then, that a quiet delirious condition came on almost invariably from ten to twenty minutes after the hypodermic injection and then passed on into sound sleep. Dr. Tirard notes, what seems to have been peculiar in his experience, that there was frequently dryness of the throat, and on one or two occasions the patient awoke with a feeling of nausea, which soon passed off. The pulse did not vary in volume, but always fell five beats or more after the injections. There was absolutely no interference with accommodation, no change in the size of the pupil, nor any marked change in reaction to light.

The conclusions which Dr. Tirard draws from the observations on this case are the following:

"Hydriodate of hyoscine is a drug which can be used with perfect safety in cases of kidney-disease where morphine is inadmissible. It is a drug which may give rest when other sedatives fail.

"If used in 2-minim doses subcutaneously it may give more satisfaction to the patient than to the attendants, since the unconsciousness may be accompanied by angry and combative delirium. Should this occur, it will probably be sufficient to diminish the amount employed.

"It is very rapid in its action, unconsciousness following in from ten to twenty minutes, and the after-effects are of a soothing character.

"Even when delirium is present in a violent form, it is followed by quiet sleep, and the patient, being unconscious, is much more refreshed than by a night of short snatches of sleep produced by chloral or bromide, and the result is a marked improvement in both aspect and temper. And, lastly, no irritation is produced around the site of injection."

NAPHTHALIN.

BORELIUS, of Upsala, gives the results of his clinical uses of naphthalin as follows: Following the advice of Rossbach, the drug was used in cases of chronic intestinal catarrh with good results when all other means of cure had failed. In abdominal typhus, even when pushed to 4 scruples daily, no effects were obtained. The best results were gained in tuberculosis of the intestines. Three cases which had presented obstinate abdominal pain and severe general symptoms were relieved after taking naphthalin with powdered coffee four or five times daily in doses of 7 or 8 grains. The post-mortem examination in these cases showed the intestinal ulcers clean and in process of healing, and many of them already cicatrized. The urine was often colored darkly, but in one case only was dysuria observed, which became so severe that the drug was abandoned.—*Medicinisch-Chirurgische Rundschau*, January 1, 1887.

ABSORPTION FROM THE MUCOUS MEMBRANE OF THE URINARY BLADDER.

The question as to the occurrence of absorption through the mucous membrane of the urinary bladder has often been considered both at the bedside and in the laboratory, but the results have hitherto been sufficiently discrepant to leave room for more exact work on the subject. The latest contribution towards a solution of the problem bears the mark of exact scientific observation, and seems to us largely to settle the matter. In the current number of the *Journal of Anatomy and Physiology* there is a paper on "Absorption from the Mucous Membrane of the Urinary Bladder," by DR. HERBERT H. ASHDOWN, late senior demonstrator of physiology in the University of Edinburgh, in which a critical summary of the work already done is given, and a series of carefully-conducted experiments is reported. The observations were made on rabbits and dogs, and consisted essentially in the analysis of results obtained by the intravesical injection through the urethra of substances possessed of known physiological properties or readily estimated chemical reactions. The author divides his experiments into three groups: (1) Those in which the drugs administered have a sufficiently distinct physiological action of their own to indicate their presence when absorbed into the system. (2) Those in which the renal elimination of the drugs given can be readily demonstrated. (3) Those in which the quantitative analysis of a solution of known chemical composition can be conducted after it has remained for several hours in the bladder. The results of the triple series are strikingly similar, and appear to justify Dr. Ashdown's conclusions. These are: (1) That absorption of a very large series of chemical substances does take

place from the mucous membrane of the urinary bladder when in a perfectly healthy condition. (2) That the urinary constituents themselves—those substances eliminated by the kidney as effete products of the system—are absorbed from the bladder in varying proportions, this applying more especially to the water and urea, but also, though to a less extent, to the inorganic solids. (3) That the degree of distention of the bladder plays a most important part in increasing or diminishing the rapidity of such absorption. (4) That regular rhythmical contractions take place in the muscular wall of the bladder; that these contractions are largely influenced by the degree of distention of the bladder, being most marked with a moderate amount of distention of the viscus, and but feebly marked in slightly distended or in over-distended conditions; and that the character of these contractions is largely affected by the nature of the fluid contained in the bladder.—*The British Medical Journal*, February 12, 1887.

PYRIDIN IN ASTHMA AND OTHER DYSPNŒAS.

The clinical studies of KELEMIN, of Buda Pest, have given us the following information regarding this drug:

In both inspiratory and expiratory dyspnœa its use was constantly followed by success; subjective and objective symptoms were alike relieved. While the effects of the drug varied with the peculiarities of the patient, its use was peculiarly efficacious in pulmonary, cardiac, and renal asthma. The writer was almost led to consider it a specific in pulmonary and cardiac asthma.

The effect of the drug in the cases which showed emphysema endured from eight to twelve hours. The curative properties of pyridin are not yet established. In two cases where marked psychic disturbances followed the abuse of morphine and chloral, the patients were greatly benefited by this remedy. The interesting question arises whether pyridin can so alleviate dyspnœa that asthmatics may be freed from the necessity of using chloral and morphine; if this result be attained it will be truly valuable.—*Medicinisch-Chirurgische Rundschau*, January 1, 1887.

DIGITALIN.

Whilst working out the toxicology of digitalin, M. LAFON has made the observation (*Archives de Pharm.*, January, p. 32) that this glucoside is not acted upon by diastase, pepsin, gastric juice, pancreatic juice, bile, beer yeast, emulsin, or the putrefactive ferment. It is not, therefore, sensibly modified in the digestive canal, but it undergoes a profound alteration in the circulation, which is probably due to an oxidation process. It was also found that the detection of digitalin is not prevented by the action of alkalies, or that of sulphuric, phosphoric, or hydrochloric acids; nitric acid, on the other hand, appears to decompose it.—*The Pharmaceutical Journal and Transactions*, January 29, 1887.

COTTON-ROOT AS A UTERINE HÆMOSTATIC.

In a paper read by DR. HENRY GARRIGUES before the Medical and Surgical Society of German Physicians of New York, and published in the *New Yorker Medizinische Presse*, as reported by the *Pittsburg Medical Review*, January, 1887, Dr. Garrigues stated his experience with the cotton-root (*Gossypium herbaceum*), of which he has made very extensive trials in all forms of uterine hemorrhage during the last two years, and which, in his hands, has certainly proved remarkably successful.

He treated one hundred and thirty-nine patients afflicted with different forms of uterine diseases, in whom hemorrhage had been a very prominent symptom, with this drug, with the following results:

	Relieved.	Not relieved.
Anteflexion	33	2
Anteversion	1	...
Retroflexion	8	...
Retroversion	1	2
Prolapse of the uterus	1	...
Endometritis hyperplastica	3	1
Pelvic inflammations (perimetritis, pelviperitonitis, parametritis, oöphoritis, salpingitis)	5	...
Subinvolution	2	...
Laceration of cervix	15	2
Mucous polypus	1	...
Fibroid	7	2
Sarcoma	1	...
Carcinoma	2	...
Following labor	3	...
Following abortion	3	...
Sanguineous leucorrhœa after menopause	1	...
Menorrhagia and metrorrhagia from unknown causes	38	5
	125	14

If the same patient presented different affections at the same time, viz., laceration of the

cervix, cellulitis, and flexion, she was only mentioned once, and that under the diagnosis which is the most frequent cause of hemorrhage,—*e.g.*, in the case cited, under flexion.

When there were indications for other methods of treatment, these were fulfilled, viz., the polypus was removed; in case of ectropion of the cervical mucous membrane, injections with liq. ferri sesquichlor. (ʒss to one pint of water) were ordered; in hyperplastic endometritis the curette was employed; malpositions were corrected and a pessary introduced; pelvic inflammations were treated with hot douches and glycerin tampons, and syphilis by specific medication.

Though this combined treatment was employed, he feels justified in drawing the same conclusions in regard to this root as a hæmostatic as he formerly did when using in its place fluid extract of ergot, fluid extract of viscum album, tincture of cannabis indica, tincture of capsicum, and bromide of potassium. Since he commenced to use the cotton-root he has always prescribed it first, and if it failed he has had recourse to the old remedies. In cases in which he could not detect any particular cause for the hemorrhage, he used cotton-root alone. He treated many other cases in hospital and private practice in the same way, of which he has, however, kept no record.

In the beginning he prescribed the fluid extract, but found it of very little benefit if not taken in very large doses, which were not tolerated well by the patients. These cases, however, were omitted in the above table, which has reference only to those treated by the drug in the form of a decoction. He directs to boil three large teaspoonfuls in a pint of water for fifteen minutes, then to strain it, and to drink it cold in three portions,—morning, noon, and night. This decoction has a red color, something like raspberry lemonade. It has an aromatic, slightly astringent taste, and is not unpleasant to take.

This decoction has tonic properties which are of value, as preparations of iron are contra-indicated until all tendency to bleeding has ceased. Patients should take it for months. During menstruation they should discontinue it for from two to four days, according to the amount of blood lost, when it should be resumed again. Like all other remedies, it is not a specific; in some patients it fails entirely, while other remedies, especially ergot, give relief; in other cases all hæmostatics are absolutely useless. He has found it, however, preferable to all other remedies in the majority of cases. It seems to have a most remarkable effect in neoplasms; in fibroids it very often not only relieved the hemorrhages, but also the pains. Even in cases of cancer and sarcoma of the uterus, he found it very beneficial as a hæmostatic and tonic.

DESCRIPTION OF ANTIFEBRIN.

Cahn and Hepp, its discoverers, describe it to be acetanilide or phenylacetamide, with the formula $C_6H_5NHC_2H_3O$ (*Centralblatt für die Medicinischen Wissenschaften*, January 8, 1887). It is produced by the action of heat upon aniline acetate, one molecule of water being driven off. It is a white, crystalline, odorless powder, which burns the tongue slightly; is almost insoluble in cold water, requiring one hundred and sixty parts for its solution, sparingly soluble in hot water, and very soluble in alcohol and wines. It is of neutral reaction, and is very stable against most means of chemical reduction.

It melts at 113° C., and volatilizes at 292° C. In large doses it produced no ill effects upon animals, and did not influence the normal temperature.

It may be conveniently administered suspended in water, as it has no bad taste, but only a slight and not unpleasant sensation of burning, and patients evince no aversion to it, even after its administration for a long time.

The discoverers report their observations upon twenty-four patients with pyrexia, and draw the following conclusions:

The doses were from 4 to 8 grains. In single doses of considerable size the best effects were produced. In comparison with antipyrin the relative strength is four to one in favor of antifebrin.

The influence of the drug began in an hour, reached generally its maximum in about four hours, and was finished in from three to ten hours. The fall of temperature which occurred after its influence was established was marked by perspiration and reddening of the skin; the rise of temperature which followed was without chills, but often with a sensation of cold. The frequency of the pulse was diminished with the decreased temperature, and arterial tension was increased. Ill after-effects were not observed. In some cases, during the reduction of temperature, thirst, diuresis, and quiet sleep occurred.

Frequently cyanosis of the face and extremities was present, which began with the fall of temperature and ceased without being followed by a chill. Antifebrin gave prompt and satisfactory results in acute joint-rheumatism.

According to an analysis of some more recent studies by the same authors published in the *British Medical Journal* for February 12, 1887, it is four times as strong as antipyrin in its effects, is very cheap, does not cause vomiting, and rarely causes any rigors, as the temperature subsequently rises again. Moreover, it causes no cerebral disturbance, and the appetite even improves under its use. In a few cases, some degree of cyanosis of the face and limbs was observed; this, however, always disappeared (without any symptoms of shivering as it faded off), and the authors paid very little attention to it. Indeed, they complain that certain remarks in some chemical advertisements have been exaggerated in this particular, in order to favor the sale of antipyrin, and distinctly state that the above appearance was not more frequently observed than after other antifebrile agents, far less than after kairin. To call it "aniline-poisoning," as has been done, is quite unjust.

The drug was used in twenty-four cases of fever, and always lowered the temperature. 15 grains given in the morning is the favorite daily dose with Drs. Cahn and Hepp. The temperature began to fall in about an hour, and continued to fall for about three hours longer; it then gradually rose again; as the temperature fell, the skin reddened, and there was perspiration; the pulse became less frequent, and the arterial tension was increased. In some cases, during the period of intermission, there was much thirst, followed by increased urination and gentle sleep.

A further series of cases, sixty in number, included twenty-nine of typhoid fever, six of erysipelas, two of croupous pneumonia, four of acute rheumatism, six of phthisis, two of pleurisy, two of pyæmia, and two of septicæmia. Liebermeister has taught us that quinine is more energetic in its effects if given coincidently with the natural daily remission in fevers, and this is also the case with antifebrin. A dose given early in the day has a far more potent effect than if given in the evening. A good dose at one time is far better than small doses frequently repeated, and in high fever the latter treatment is useless at first. But, if the temperature be brought to the normal by a good daily dose (15 grains) for two or three days consecutively, it will be found that small doses of 2 or 3 grains daily will often suffice to keep it low afterwards.

As to the limit permissible, the authors themselves repeatedly took 1 or 2 grammes a day without the least effect; and one young man, who was suffering from diarrhœa, took 3 grammes (46 grains) daily for a week without the least discomfort. Indeed, Fürbringer and Reise raised the dose boldly to over 90 grains daily without harm,—a dose certainly equivalent to 5 drachms of antipyrin. Thus there is no cause for disquietude with the moderate doses recommended, but it is always advisable to study the individual susceptibility.

But one of the chief advantages of antifebrin over antipyrin is the freedom from vomiting after it, and patients who usually had retching, or even vomiting attacks, after antipyrin, took antifebrin without any discomfort. No irritation of the urinary passages was observed. In some cases of albuminuria, the albumen disappeared during the use of the drug; in others, not till the patient was free from fever. Again, shivering was rarely seen after antifebrin, whereas it is a common result after antipyrin.

The patients feel much better after antifebrin, and the mind is cleared to a remarkable extent. This is best noticed in typhoid cases.

Another advantage of antifebrin is the rise of arterial tension, together with lessened frequency of the pulse. Even when directly injected into the veins of animals, antifebrin never causes lowering of the arterial tension. This was established by experiments in Professor Schmiedeberg's laboratory. At the same time the increased diuresis caused by antifebrin is distinct evidence of its favorable effect upon the circulation.

No specific action of this drug is claimed as against any disease in particular; the chief experiences of Cahn and Hepp related to typhoid.

From all this it appears that, as said above, antifebrin is evidently a powerful antifebrile agent worthy of further trial. It is no doubt unfortunately true that the action of these aniline derivatives is of a more or less evanescent character, but this may be compensated to a great extent by giving them in appropriate repeated doses. It may be added that Lépine (*Semaine Médicale*, 1886, p. 473) calls this agent a "nervine," and finds that it relieves the peculiar pains common to "tabid" subjects.

ALKALOIDS OF BERBERIS VULGARIS.

A contribution towards clearing up the confusion concerning the berberis alkaloids has been made by Dr. O. Hesse (*Berichte*, xix. 3190). Dr. Hesse states that in the root of the *Berberis vulgaris* berbine is accompanied by at least four other alkaloids. Upon treating a mother-liquor of berbine hydrochlorate with soda, a dark-colored precipitate is thrown down, from which ether removes not only oxyacanthine, as stated by Wecker, but at least two other alkaloids, whilst another brown-colored amorphous base remains undissolved. The oxyacanthine may be obtained as sulphate by dissolving the mixture taken up by ether in acetic acid and adding sodium sulphate to the solution. By treating the mother-liquor with sodium nitrate another alkaloid can be separated that has been named "berbamine," whilst the third alkaloid is thrown down by excess of ammonia. Oxyacanthine presents the peculiarity of having two widely separated melting-points; when precipitated by ammonia from an aqueous solution of the hydrochlorate as sulphate it forms a white, flocculent mass, which loses water at 100° C. and melts between 138° and 150° C., but when crystallized from ether it forms anhydrous needles that melt first between 208° and 214° C. It forms well-crystallized salts with acids, and its composition is represented by the formula $C_{18}H_{19}NO_3$. In the presence of caustic alkali oxyacanthine readily undergoes modification to β-oxyacanthine, which is no longer soluble in ether, and which probably differs in the fixation of the elements of a molecule of water, but on treatment with hydrochloric acid the water appears to be separated again, normal hydrochlorate of oxyacanthine being formed. In this respect the alkaloid presents some resemblance to narcotine. Berbamine is also represented by the formula $C_{18}H_{19}NO_3$.—*The Pharmaceutical Journal and Transactions*, January 29, 1887.

RESEARCHES UPON THE DIGESTION OF ALCOHOL.

Gluzinski, of Krakau, reports the following results from his experiments upon the digestion of alcohol:

It disappears rapidly from the stomach.

Aldehyd cannot be detected, and most probably alcohol is absorbed as such into the circulation.

The digestion is divided, when alcohol is taken, into two phases,—that occurring in the presence of alcohol; that which takes place after its absorption. The first period is marked by a somewhat retarded digestion of albuminates; the second exhibits the secretion of a large amount of fluid containing an abundance of hydrochloric acid. The mechanical power of the stomach is moderately increased.

The secretion of gastric juice continues after active digestion has ceased longer with than without the use of alcohol.

Under the influence of alcohol large quantities of fluid are collected in the stomach, which become tinged with bile. Comparison of digestion when alcohol is used as an aid to the digestion of considerable quantities of food and when it is not used, shows that small doses improve digestion. The explanation of this fact lies in the large quantity of hydrochloric acid which is secreted after the absorption of the alcohol, which results in the digestion of large amounts of albumen which remain. The retardation of the secretion of the first period endures much too short a time, after the use of small quantities of alcohol, to be of importance.

The diminution of the mechanical activity of the stomach is much too small to be of moment. When, however, large quantities are taken, the result is different; for example, one hundred cubic centimetres of twenty-five per cent. alcohol is absorbed from the stomach in fifteen minutes; but with much larger amounts the movements of the stomach are hindered, food remains longer in the stomach, and the rapidity of digestion is much retarded. The administration of alcohol before food results in favor of digestion, from the fact that the acid resulting from the effect of the stimulus is an aid in digestion.

In cases alike of lessened and increased formation of acid the use of strongly alcoholic drinks is prejudicial, from the fact that diminished secretion will be still further lessened and increased formation of acid still more increased. When, however, the condition of the patient demands a nervous excitant, alcohol should be given before meals.—*Deutsche Med. Zeit.*, Jan. 3, 1887.

DIAGNOSIS OF GASTRIC DISEASE.

Zweifel, of Zürich, has reached the following conclusions from clinical studies:

Delay in digestion is a symptom of gastric disease, most pronounced in dilatation and cancer, least in chronic catarrh, slightly developed in ulcer of the stomach.

In gastric ulcer, with extensive and recent destruction of mucous membrane, the period of absorption is much lengthened; in cancer of the cardiac portion it is much shorter than when the cancer is at the pylorus.

When absorption from a fasting stomach lasts more than twenty minutes, dilatation or cancer of the pylorus, or possibly both, are present if the presence of extensive and recent ulceration is excluded. When by distending the stomach, or examination with a sound, it is proven that dilatation is not present, pyloric cancer is probable.

A differential diagnosis between carcinoma and simple ulcer can hardly be made from the single symptom of delayed absorption. When dilatation exists, delayed absorption will not show the presence of cancer, but the presence of a tumor; general cachexia and the absence of free hydrochloric acid are needed to complete a diagnosis.

A differential diagnosis between gastric catarrh and ulcer is not possible from the condition of absorption alone.

In diseased stomachs the difference in the rate of absorption between filled and empty stomachs, and in the same individual on different days, is less than in healthy subjects.

Gastric ulcer and dilatation can be so successfully treated that a normal power of absorption is established.—*Deutsche Med. Zeit.*, Jan. 3, 1887.

THE ACIDS OF HEALTHY AND DISEASED STOMACHS.

Cahn and Mering have made the following observations:

It is possible to estimate quantitatively the amounts of lactic and hydrochloric acids in the same stomach.

In normal cases we find a half-hour after the ingestion of food a certain amount of hydrochloric acid.

With purely meat diet hydrochloric acid only is present.

The stomachs of healthy and diseased persons contain, when mixed diet is taken, in addition to hydrochloric acid, considerable quantities of fermentation acids and mixed acids, and these quantities increase the longer the food remains in the stomach.

In fever and severe anæmia hydrochloric acid may be absent.

In amyloid cachexia hydrochloric acid is generally present.

In cancer of the pylorus the presence of hydrochloric acid is the rule, its absence the exception; it is present, not in traces, but in considerable amounts.

Methyl-anilin-violet is colored blue by the hydrochloric acid of the stomach, and is a test for its presence.—*Deutsche Med. Zeitung*, Jan. 3, 1887.

INTRA-PULMONARY INJECTIONS.

Dr. Arthur Ransome publishes in the *Medical Chronicle* for January, 1887, the account of one case of gangrene of the lungs and four phthisical cases which were treated by intra-pulmonary injections. The one case in which the treatment was thoroughly carried out was that of gangrene of the lungs occurring in a woman, aged 33, in whom gangrene followed an attack of acute pneumonia. The diagnosis was readily made that the case was one of gangrene of the right base of the lung, with a cavity upon the left side due to bronchiectasis. The patient was ordered iron and quinine, and inhalations of carbolic acid through hot water, with eucalyptus oil on a respirator inhaler. These means somewhat diminished the fetid odor of the breath and the sputum, and two days later 10 minims of an ethereal solution of iodoform—1 grain in 5 minims—were injected into the cavity on the right side, and a similar injection was made daily into this cavity, except upon two days, when it was injected into the left cavity, where it caused much more pain than upon the right. After two days of this treatment it was noticed that the sputum had lost its prune-juice color, and was less offensive, and the patient felt better, but the cough and amount of muco-purulent expectoration remained excessive. Subsequently an emulsion of iodoform in olive oil was employed as an injection, with much less pain to the patient, and this treatment was continued, with intervals of a few days, for several weeks, during which time she gained about ten pounds in weight and improved greatly in general health; even the bronchiectasis disappeared; and, though the cavity in the right lung was still perceptible, the patient, at the date reported, had no cough, no expectoration, and appeared to be in good health.

The injections were made by inserting a long needle between the ribs, near the upper margins of the lower one. Care was taken to ascertain if the end of the needle had reached the cavity, or, at any rate, an air-space, by withdrawing the piston, and, unless air bub-

bled through the fluid, the needle was moved slightly, until this sign of having penetrated into the air-channels was observed.

In the treatment of the cases of phthisis some good effect was temporarily produced in two cases; but, on the whole, the results were not encouraging. Apart from the danger of accident, such as hemorrhage or pneumothorax, the procedure is somewhat alarming and disagreeable to the patient. The ethereal solution was very painful, and the olive-oil emulsion was so viscid that a larger needle had to be used than was absolutely safe.

The solution of iodoform in oil of eucalyptus was the most satisfactory of all the mixtures that were tried.

THE USE OF SPLEEN-PULP IN ANÆMIA.

MARAGLIANO has reported the results of his experiments with spleen-pulp in cases of impoverished blood and the conditions depending upon it. The pulp was given with an emulsion of bitter almonds in accordance with the following formula:

℞ Emuls. amygd. amar., ℥x;
Pulpæ splenic., ℥iv;
Spt. vini gallici (cognac), ℥ii.

This amount was given in twenty-four hours with meals. The diet consisted of soup with rice, or bread, at eight o'clock in the morning; a second soup, with four ounces of meat and bread, with a glass of wine, at noon; and a third soup at six in the evening. Five cases of chlorosis were treated in this manner, with the result, in from eight to twenty-five days, as follows: increase of general strength, increase of red blood-corpuscles; rapidly restored functional activity of the nervous, digestive, circulatory, and urinary mechanisms; increase of arterial tension and body-weight. The number of cases is manifestly too small for accurate results, but sufficiently large to awaken interest in the mode of treatment.—*Deutsche Medizinal-Zeitung*, January 3, 1887.

AN EXPERIMENTAL RESEARCH UPON RABIES.

At a meeting of the Philadelphia Academy of Surgery, held February 7, 1887, DR. HAROLD C. ERNST, of Boston, read a paper on the above subject (*Medical Times*, February 19, 1887).

His experiments were performed with three objects in view: first, to determine whether or not there was such a thing as a virus of rabies; secondly, if there is such a virus, does drying at an even temperature modify its strength? thirdly, does the inoculation of such modified virus afford immunity against the inoculation of a stronger virus?

The different series of experiments relating to these various points were then given in detail. The animals used in most of the experiments were rabbits, although guinea-pigs and dogs were also employed.

The following conclusions were reached:

1. That there exists in the cords and brains of animals inoculated in Pasteur's laboratory a *specific virus* capable of the production of similar symptoms through a long series of animals.

2. That these symptoms are produced with absolute certainty when the method of inoculation is by trephining the skull and injection under the dura mater; with less certainty when the inoculation is by subcutaneous injection.

3. That the strength of this virus is lessened when the cords containing it are removed from the animals and placed in a dry atmosphere at an even temperature.

4. That the symptoms produced by the inoculation of this virus only appear at a certain period of incubation, distinctly shorter when the inoculation has been done by trephining than when done by subcutaneous injection.

5. That injections of the virus modified in strength by drying, and in the manner prescribed by Pasteur, exert a very marked protective influence against an inoculation with virus of full strength.

6. That a very moderate degree of heat destroys the power of the virus entirely, whilst prolonged freezing does not injure it.

AN UNUSUAL CASE OF ACUTE INTOXICATION FROM MORPHINE.

SCHEIBER, in the November meeting of the Society of Physicians of Budapest, reported the following interesting case:

A neurotic woman, aged 54, suffering from a severe neuralgia, was given in three days' time $\frac{9}{16}$ of a grain of morphine hypodermically. After taking the last injection she passed into a deep sleep, which persisted forty-eight hours, during which she exhibited the following symptoms of severe morphine intoxication: convulsive movements and cy-

anosis in the face, dry tongue, loud tracheal râles, dyspnœa, perspiration, incontinence of urine and of fæces, subnormal temperature. The patient recovered in the main in three days, but exhibited for six weeks the following symptoms: aphasia, agraphia, alexia; a small bed-sore upon the buttock, and a small dry crust upon the right heel; entire amnesia; disturbances of mind, which showed themselves in irritability, childish movements, and deceptions of the senses.

The neuralgia of the right lower extremity disappeared, as did the most prominent nervous disturbances after galvanization of eight days. Scheiber attributes the symptoms in the case to acute morphine intoxication followed by profound disturbance of nutrition, and well-marked cerebral hyperæmia and capillary apoplexy.—*Centralblatt für Nervenheilkunde*, January, 1887, No. 1.

RECTAL INJECTION OF GASES IN DISEASES OF THE LUNGS.

The Paris correspondent of the *British Medical Journal*, February 12, 1887, writes that at a recent meeting of the Biological Society, M. Morel commented on M. Peyrou's experiments on the effects of the rectal injection of sulphuretted hydrogen in dogs, and compared the doses with those employed in the treatment of tuberculosis. One hundred and fifty cubic centimetres of a saturated solution of sulphuretted hydrogen were injected in two doses at intervals of three minutes. Symptoms of poisoning began to be manifested within two minutes, and death took place in ten minutes. Another dog died quickly after two injections of the same strength, given at intervals of twelve minutes, while two others, in whom only very small quantities of the gas, or large quantities very much diluted, had been injected, experienced only slight inconvenience, and rapidly recovered. M. Peyrou concludes that sulphuretted hydrogen is harmless only when injected in small doses. With regard to these experiments, M. Morel observed that the quantities injected were enormous, being ten or fifteen times as great as those employed in man; and, supposing the dog to be four times lighter than man, the dose injected in the dog was really forty or fifty times as great as that employed in man. M. Morel then described in detail the mode of proceeding in the treatment of tuberculosis. The patient should be placed on his back in a position to allow free expansion of the intestines, and the operator must carefully note any resistance to the entry of the gas, so as to allow absorption to take place during the operation. The breathing should be watched, especially when the pulmonary lesions are extensive, as any deficiency in respiration will make the elimination of the gas correspondingly difficult. Moreover, the substance used in the above experiments on the dog is not the same as that employed in pulmonary affections. In the latter case, the gas which is injected is a mixture of carbonic acid and sulphuretted hydrogen, and possesses properties very different from those of sulphuretted hydrogen alone. When intestinal irritation takes place, it is because the gases are not properly mixed. M. Peyrou injected into the dog twenty-five, thirty-five, ninety, and even one hundred cubic centimetres of sulphuretted hydrogen dissolved in a considerable quantity of water. In man, the quantity injected is not more than twenty-five cubic centimetres. M. Morel then described an apparatus for making these injections, the chief objects aimed at in its construction being to prevent any atmospheric air from mingling with the sulphuretted hydrogen and carbonic acid, to moisten the gaseous mixture, and to prevent too great distention of the intestine.

LEAD-POISONING FROM CHOCOLATE WRAPPED IN TIN-FOIL.

Johanson, of St. Petersburg, writes of the frequent use of tin-foil as a wrapper for chocolate, cheese, tea, tobacco, and other articles, and refers to cases already in print in which poisoning from the lead contained had occurred. The need for sanitary inspection and regulation in the sale of such articles is evident.

A certain per cent. of lead in tin-foil is recognized as permissible, according to Hegar 6.6 per cent., while others give fourteen per cent., while an overweight of tin will cause lead to be absorbed by the material which is enclosed by the foil. In these cases paper is generally interposed between the foil and its contents.

Johanson took three samples of chocolate from St. Petersburg manufactories, two of which were carefully separated from the foil by paper, and examined the chocolate by boiling one gramme with diluted nitric acid, and treating the filtrate with sulphuric acid and alcohol, when the lead present was pre-

cipitated. The two packages of chocolate wrapped in paper as well as in foil gave an amount of lead sulphate equal to 94.1 per cent. and 94.6 per cent. of the metallic lead; the chocolate wrapped in tin-foil only gave .7 per cent. of lead. As all three packages came from the same factory, it was evident that the dealer had purposely separated the cheaper foil from the chocolate by paper.

The use of paper is not a sure protection, however, for chocolate is seldom free from water, and when kept for some time the water may penetrate the paper, and oxidation, the formation of salts, solution and the deposition of lead in the material enclosed follow.—*Pharmaceutische Zeitschrift für Russland*, Jan. 11, 1887.

TRANSPLANTATION OF TENDON FROM ANIMAL TO MAN.

The Paris correspondent of the *British Medical Journal*, February 12, 1887, refers to a note by M. PEYROT on the transplantation of tendon from an animal to man. The patient, a boy, aged 14, entered the Hôtel Dieu in October, 1885. Six months previous to that date, he had received a wound on the palmar aspect of the first phalanx of the left middle finger, near the groove between the first and second phalanx. The flexor tendons were completely divided, and the finger was forcibly drawn back by the extensors. Simple suture of the two ends was out of the question, on account of the great length of time that had elapsed since the infliction of the injury. On October 30 an incision was made over the first phalanx in its palmar aspect, extending into the palm of the hand for a distance of about four centimetres. The ends of the tendon having been found with some difficulty, a piece of flexor-tendon thirty-three millimetres in length was taken from the hind paw of a young dog, and united to the vitalized ends of the divided tendon by three stitches of catgut. The incision itself was brought together by two rows of stitches; a deep one, near the transplanted tendon, in order to form a sheath, and a superficial one, in the skin. The operation was done with the most minute antiseptic precautions. When the first dressing was removed, ten days after the operation, it was found that there had been no suppuration; but unfortunately union had not taken place. There was, however, no sloughing, and the wound healed well. When the patient left the hospital on January 4, 1886, he had regained the use of all the fingers of the injured hand, though the movements were still feeble. In a similar case in a child aged 2½ years, the transplanted tendon (the tendo Achillis of a cat) was completely eliminated three weeks after the operation. M. Peyrot considers that, as a general rule, transplantation should be had recourse to only in cases of real loss of substance, or when the length of time which has elapsed since the injury has produced a definitive separation of the two ends of the tendon.

THE THERAPEUTIC VALUE OF TINCTURE OF CANNABIS INDICA IN THE TREATMENT OF SUBACUTE AND CHRONIC DYSENTERY.

In the *Indian Medical Gazette* for December, 1886, MR. S. J. RENNIE reports four cases of dysentery, the first three being subacute and chronic, and the last of the acute form, in which cure resulted from the administration of tincture of cannabis indica, even after ipecac with opium, Dover's powder, nitrate of silver injections, and various other modes of treatment had failed.

Mr. Rennie first tried the officinal tincture in doses of 20 minims three times daily, but he has since found that this dose sometimes produced slight toxic symptoms, and he has consequently reduced the quantity to 15 minims, and prescribes it according to the following formula:

℞ Tinct. cannabis indicæ, ♏xv;
Bismuth. subcarb., gr. v;
Mucilag. acac., ʒss.
Misce, et adde
Tinct. zingiberis, ♏xx;
Tinct. carda. co., ♏xx;
Spt. chloroform., ♏xx;
Aqua cinnamom., ad ʒi ter die sum.

Even in these doses it is necessary sometimes to order it to be taken after meals, as it occasionally produces vertigo. It is pleasant to take, and there is no subsequent nausea. The administration requires to be kept up for several days after all symptoms have ceased.

PERSISTENT VOMITING AS A CAUSE OF EAR-TROUBLES.

Vomiting is not usually included in the list of causes which occasion catarrh of the middle ear. It is well known that aural affections frequently complicate general wasting diseases, especially in their final stages. The pharyngeal muscles waste along with the body, and the sufferer's last days are aggra-

vated by distressing tinnitus and vocal reverberation. Whenever any movement occurs in the throat, nose, or mouth, the sound is conveyed to the tympanum up the unduly patent Eustachian tube, causing an unnatural ringing and roaring noise in the ear. Added to this cause, MR. CHARLES ATKIN (*British Medical Journal*, February 12, 1887) suggests that while undue patency of the Eustachian tube will in many cases account for the symptoms complained of, the impaction of minute particles of regurgitated food or mucus in the tubes during the act of vomiting may also serve to produce aural complications. In the simple act of vomiting the contents of the stomach are not unfrequently ejected from the nostrils, and the tubal orifices may easily become plugged. Should the act be repeated constantly, as often happens in all renal and cerebral affections, the plug may be driven still farther up, until it becomes lodged at the narrowest part, at the junction of the cartilaginous portions with the bony part of the tube.

Mr. Atkin reports two cases in which such a complication occurred. The right ear, and then the left, became successively affected through the plugging of the tubes.

SURGICAL TREATMENT OF HYDATIDS OF THE LIVER.

At a recent meeting of the Royal Medical and Chirurgical Society MR. RICHARD BARWELL read a paper on widely incising, by a two-stage method, hydatids of the liver (*Lancet*, January 29, 1887). Hydatids of the liver may be treated surgically by (1) puncture with a small trocar, (2) evacuation with a large persistent opening, and (3) electrolysis. This last has not commended itself to the judgment of the profession. The author recommends that the first method should always be primarily resorted to, chiefly because it sometimes is curative,—viz., in cases of single barren cyst; but in a large proportion of cases there are numerous daughter or secondary cysts, and then the tumors frequently recur. Under such circumstances the most efficacious treatment is by keeping a large opening patent for some time. The object of the paper was to point out the safest way of making such an opening. After discussing certain other methods, it was shown that incising the abdominal parietes first, then stitching to them the cyst or its surroundings, and finally cutting into the tumor after a few days, was regarded as a very safe and efficacious procedure. The author recommended certain precautions to be taken when the cyst-wall appeared so thin that a needle-puncture might cause effusion of hydatid fluid into the peritoneum. Some modifications introduced with a view to meet special circumstances were discussed. The case of a young woman who had a hydatid of the liver which had been punctured eight times, and on whom the author performed the above-mentioned operation, was related. After a time eighteen hydatids and the wall of a large mother-cyst were passed from the wound. There was an absence of peritoneal symptoms, and the patient made an easy recovery.

MR. W. HAWARD considered that the character of the contents of the hydatid cysts should determine the nature of the operation. Doubtless a free opening would be required if the contents were thick and compounded of daughter-cysts. He criticised Mr. Barwell's method, and thought that the potassa fusa caustic was to be selected, rather than the one which Mr. Barwell advised. His remarks were illustrated by cases. In one instance a second cyst was found bulging into the first, which had been emptied. The second one was also opened through the first, but still the patient did not recover, and finally died with lardaceous disease. Hydatids were found in the omentum and spleen, and a suppurating cyst in the back of the liver, which was doubtless the cause of the continued illness and lardaceous disease. Altogether the method of gradual perforation of the abdominal wall, so as to secure proper peritoneal adhesions, was to be preferred to other methods.

MR. HOWARD MARSH had successfully practised the operation recommended by Mr. Barwell in one case recently. The sutures had to be passed into the substance of the liver because the hepatic peritoneum was so thin. The suppurating hydatid cyst was incised four days afterwards. In a case of suppurating hydatid cysts of the liver in a little child, an abdominal section was made without attempting to secure adhesion between the liver and abdominal wall. The result was satisfactory, and the case not complicated by the extravasation of the contents of the cysts into the peritoneal cavity.

MR. HARRISON CRIPPS considered that the free incision enabled the surgeon to deal with multiple cysts, which, in his experience, were frequent complications of hydatids of the liver. A case illustrating the advantage of a

free incision was mentioned. In this instance special precautions with a view to obtaining adhesions were not used. A second cyst was completely emptied through the wall of the first cyst, which had also been completely evacuated. The results were perfectly satisfactory.

Sir Dyce Duckworth had seen good results after all the methods of treatment for hepatic hydatids. He was doubtful of the excellency of the advice that all the contents of the cyst should be evacuated at the surgical operation. It was still a point for the surgeons to decide whether the cysts should be completely cleared out, and whether antiseptic injections should be practised.

Mr. Walsham remarked that surgical treatment of hydatid cysts was not always of a harmless nature. A few cases of sudden death, even from aspiration, had been recorded. Perhaps this was due sometimes to hydatid fluid escaping into the venous circulation. He could not but think that an incision four inches long would be attended with some danger. In several cases of the kind he had made the incision from an inch to an inch and a half in length, and found this size ample for all purposes. There was but little fear of pus or hydatid fluid escaping into the peritoneal cavity, and he thought that excellent results could be obtained without the surgeon first endeavoring to secure adhesions of the cyst to the abdominal wall. After evacuation of the contents the cysts should be well syringed with carbolic acid solution, and then powdered by iodoform. In his own practice the wounds healed under this treatment with the best possible results.

Dr. Angel Money said that a continental surgeon was operating by abdominal section on a case of hydatid of the liver when the patient suddenly fainted and died. A daughter-cyst must have escaped from the liver and entered into the hepatic vein, for one was found free in the right auricle of the heart.

Mr. A. Pearce Gould thought that aspiration should be tried first in all cases. It was still an open question as to what was the best means to be adopted even in aspiration. Should the surgeon remove all the hydatid fluid obtainable, or only a small quantity? Perhaps the latter method was the safer. In one case that had been under the care of Dr. C. Y. Biss, in a woman aged 40, Mr. Gould made an incision through the right linea semilunaris, when peritoneal adhesions were found, and four quarts of pus and hydatid cysts evacuated. The patient began retching, and the omentum protruded at the lower part of the wound. In the omentum abortive hydatid cysts were seen, but the omentum was easily returned and the sinus eventually closed. In a second case there was a very large hepatic tumor, from which reddish serous fluid, without hooklets, was drawn off. After incision two pints of fluid flowed out, and a large quantity of solid material was discovered. Some days later much of this material was scraped away, and some bleeding resulted. The case had now almost completely recovered. He was strongly in favor of the knife as against caustics. He did not think it was necessary to stitch the wall of the cyst to the abdominal wall before opening the tumor.

Mr. Henry Morris supposed that the chief point for discussion in the paper was the necessity or not of a double operation. In a work of Dr. W. Thompson, published in 1841, on diseases of the liver and biliary passages, four methods of treatment were fairly stated. Some quotations were made by Mr. Morris from an article published in the *Madras Quarterly Medical Journal* for 1839 by an Indian surgeon, in which the opinion was expressed that there was not much danger of effusion into the peritoneal cavity in opening abscesses of the liver. The plan of attaching the cyst to the abdominal wall was perhaps associated with that of gastrostomy and colotomy, but the procedures in the three cases were altogether different; for in the two latter operations a mobile and contracting organ had to be dealt with. In hydatids of the liver it was necessary to obtain a sufficiently large opening to allow of the escape of bulky contents. It was not difficult to secure coaptation of the cyst to the abdominal wall, and thus to prevent the escape of fluid into the peritoneum. Manipulations were also possible by which this coaptation could be secured at the time of operation. He thought that there was no necessity for a division of the operation into two stages. He could not think the procedure of Mr. Harrison Cripps—of removing the entire mother-sac—an advisable one. Once, when tempted to perform this, he had in his recollection the case recorded by Dr. Bright, in which the stripping of the parent membrane from the adventitious coat was followed by hemorrhage that nothing succeeded in stopping. Once also a boy was run over and died. It was found at the necropsy that a hydatid cyst of the liver had become detached from its adventitious capsule, with consequent fatal extravasation of blood between the true and

the false sac of the hydatid. The surgeon should, in his opinion, empty as much of the fluid and daughter-cysts as would come away without using force, but he should not attempt to remove the parent sac at the time of operation. He had never resorted to irrigation, but aseptic drainage-tubes should be used. The indiscriminate use of iodoform in the cyst might be followed by disagreeable delirium, and perhaps even death.

MR. BARWELL said that he could supply the sequel to the case narrated in the paper. A small but long sinus persisted for some time, but had recently completely healed. He had a dread of filling a large cavity with iodoform; symptoms of blood-poisoning had been known to occur after such free dressings with this powerful antiseptic.

COCAINE COTTON.

MR. K. ELLER describes in the *Druggists Circular* for December, 1886, a very easy, neat, and successful way whereby to obtain the effect of cocaine by combining it with absorbent cotton. As thus prepared, it may be applied in a variety of ways to assuage pain and bring relief to those suffering. It requires the suggestion merely in order to insure its ready preparation by an ordinarily skilful pharmacist; for instance, a given weight of absorbent cotton, a certain quantity of solution of cocaine of definite strength, and the requisite skill, and a cocaine cotton of exact cocaine value will be the result. A three per cent. solution of cocaine is a good average strength to work with, and on this basis the following formulæ are suggested, unless an exception be noted:

COCAINE COTTON.

Solution cocaine, 3 per cent., ℥i;
Absorbent cotton, ℥i.

Thoroughly saturate the cotton, carefully dry same in a current of warm air, and card the cotton to restore it to its former appearance.

COCAINE COTTON WITH MORPHINE.

(For toothache.)

Solution cocaine, 3 per cent., ℥i;
Sulphate of morphine, gr. xii;
Absorbent cotton, ℥i.

Dissolve the morphine in the solution of cocaine, and proceed as above.

To be used by introducing a small piece of the cotton into the cavity of the tooth. It can also be used for earache by moistening a suitable piece, with a few drops of water, laudanum, or alcohol, and carefully placing it in the ear-passage.

BORATED COCAINE COTTON.

(For burns and scalds.)

Cocaine solution, 2 per cent., ℥i;
Boracic acid, gr. xxx;
Glycerin, ℥i;
Carbolic acid, gr. xx;
Absorbent cotton, ℥i.

Dissolve the boracic acid in the glycerin and cocaine solution, add the carbolic acid, and proceed as in making plain cocaine cotton.

Very useful in the treatment of burned and scalded surfaces, and also in troublesome chafing, where pain and persistent inflammation are attendants.

This list is capable of very large extension. Only this short suggestion is needed to enable the pharmacist to carry his experiments to the limit of wish or convenience.

TREATMENT OF HÆMATOMA OF THE EAR.

DR. A. LEBRUN, in a clinical lecture published in the new Brussels journal, *La Clinique*, says that after having tried various plans for the treatment of hæmatomas of the ear, including free opening as well as Follin's method of making a number of punctures, and having found them all very unsatisfactory, he has latterly injected iodoformed ether with complete success. For this two needles are inserted into the tumor at opposite points; through the larger one, No. 3 of Dieulafoy's aspirator, the contents are drawn off, the puncture being closed by means of iodoformed collodion. Then through the remaining needle, which is that of an ordinary hypodermic syringe, from 15 to 60 minims of a solution of iodoform in ether, of a strength varying from two to ten per cent., is introduced into the cavity of the tumor. This injection causes some pain, which, however, soon passes off. No dressing is required, and a complete cure results. In one case M. Lebrun twice injected a saturated solution of iodoform in ether without evacuating the contents of the tumor. This occasioned severe and prolonged pain, an eschar of the size of a half-franc piece formed, and although this healed, the process required more than three weeks. The comparatively unsatisfactory result in this case is considered by M. Lebrun to have been due to the escape of a large part of the first injection, and to overdistention of the tumor.—*Lancet*, February 19, 1887.

NOTES ON PYRETHRIN.

The root of the *Anacyclus pyrethrum*, or pellitory of Spain, has long been used in medicine for its well-known properties as a sialagogue and local irritant. Its fusiform root, that breaks with a resinous fracture, with its radiated structure and black spots, cannot easily be mistaken.

In earlier times it was officinal in the majority of the pharmacopœias of Europe, in which it formed an active ingredient in numerous stimulating powders, tinctures, and gargles.

According to Mr. C. J. S. Thompson (*The Pharmaceutical Journal and Transactions*, January 15, 1887) the root owes its irritating properties to its active principle pyrethrin, or pyrethric acid, a very acrid resinous substance, which resides mostly in the cortical portion. A good sample of pellitory will yield about five per cent. of pyrethrin. On analysis the root is found to contain, besides pyrethrin, an acrid resin, volatile oil, yellow coloring-matter, tannin, gum, and inulin. Pyrethrin is a soft, dark brown resinous substance, having an unpleasant odor, and extremely hot and pungent to the taste. A very minute quantity placed on the tongue causes a strong burning sensation, which shortly increases, and remains for a considerable time, inducing a copious flow of saliva. A strong solution painted on the skin causes a sharp prickling sensation, and reddens the part where it has been applied. If the part is kept covered, a blister will be produced. Pyrethrin may be obtained by evaporating a washed ethereal extract, or the following more satisfactory method may be employed: Reduce the root to a coarse powder, and exhaust it by means of percolation with alcohol. Acidulate the percolated powder with acetic acid, and boil with more alcohol, and filter; mix the liquids and evaporate.

It is soluble in ether and alcohol, and readily soluble in oils or acetic acid. Pyrethrin is composed of an acrid, brown resinous substance, which is soluble in alcohol, but insoluble in water and strong alkaline solutions; and a dark yellow oil, which is soluble in alkaline solutions. This oil is not nearly so acrid as the brown resinous matter, and it is probable that what burning taste it possesses is due to a small quantity of the resin being mixed with it.

DIFFERENT METHODS OF TREATING CERVICAL CATARRH.

Dr. L'voff, of Kazan, has reported in the *Meditsinskoe Obozrenie* (*Lancet*, January 22, 1887) a number of observations made on the comparative value of different methods of treating catarrh of the cervix uteri. The total number of cases was eighty-two. Of these, thirty-six were treated by mechanical scraping of the mucous membrane, eighteen by means of powerful caustic applications, and twenty-eight with weak caustics. The method of applying the weak caustics was, after washing out the vagina with warm water or a solution of boracic acid, to swab the cervical canal with tincture of iodine or with a ten per cent. solution of chromic acid. This was done once a week, plugs soaked in glycerin of tannin being also used every other day. The strong caustic application consisted of a bougie made of sulphate of zinc and alum fused together. This was allowed to remain in the canal till it had all dissolved, which took place usually in one or two hours. Afterwards the mucous membrane presented a white appearance, due to the eschar. This fell off in five or six days, during which time warm vaginal douches were administered, and plugs of glycerin and iodoform inserted every alternate day. In the cases treated by scarification an iodoform and glycerin plug was left in for twenty-four hours, and the patient was then sent home. The results of these different methods of treatment were that the mild caustics ultimately effected a cure, but required at least two months to do so; while the severer methods—that is to say, the fused zinc and alum and the scarification—produced a permanent cure in about a fortnight. The author adds that no unpleasant symptoms were caused by either the caustics or the scarification in any of the eighty-two cases.

THE ADMINISTRATION OF PHOSPHORUS IN RICKETS.

The administration of phosphorus and of phosphates in rickets has been recommended, on the ground that in the diseased bones the earthy phosphates are greatly deficient, and that, introduced into the system, these substances will supply the deficiency. Phosphorus, as is well known from the researches of Wegner, when given to growing animals, renders the developing cancellous tissue of the bones denser than natural, more like the compact tissue; even in adult animals a similar change takes place. These results are independent, as Wegner showed, of the presence of excess of phosphates, for they occur when phosphates are absent from the food. Although, there-

fore, the reason for the administration of phosphorus in rickets is well grounded, medical men hold very different opinions as to its utility in that disease. Some have given it with cod-liver oil; as in Kassowitz's phosphorized cod-liver oil, which contains 0.01 per cent. of phosphorus. The objection to this mode of administration is not only that the phosphorus tends to deposit on standing, and thus a variable and even dangerous dose may be given, but it is impossible to say how much benefit (if any) that ensues is due to the oil, and how much to the phosphorus. A better mode of administration has been devised by Hasterlik. Phosphorus (0.01 per cent.) is dissolved in bisulphide of carbon (0.25 per cent.), and one hundred parts of water added; 1 teaspoonful is given twice daily, constituting a dose of 0.0001 gramme in the day. The bisulphide of carbon not only acts as a solvent for the phosphorus, but has, according to Dujardin-Beaumetz, a beneficial effect in intestinal catarrh, and might thus be of service in the early stages of rickets. How far this preparation is beneficial in the disease has not yet been sufficiently ascertained.—*The British Medical Journal*, February 19, 1887.

Reviews.

HOUSE PLANTS AS SANITARY AGENTS; OR, THE RELATION OF GROWING VEGETATION TO HEALTH AND DISEASE. COMPRISING ALSO A CONSIDERATION OF THE SUBJECT OF PRACTICAL FLORICULTURE AND OF THE SANITARY INFLUENCE OF FORESTS AND PLANTATIONS. By J. M. Anders, M.D., Ph.D., etc.
Philadelphia: J. B. Lippincott Company, 1887.

Those who are already interested in plant-growing will find every page of this work full of interest to them, entirely apart from the question of the soundness of the author's views in relation to the remedial value of growing plants. So thoroughly has he studied the subject, so completely is he absorbed in it, and so practically, that there is scarcely a suggestion of value in regard to house-gardening that he has not given, and the unscientific florist will find his own field of view vastly widened, and to his great advantage, by the wider view of the author, who brings to the work a skill and science already cultivated in a far more trying field.

The question of the value of plants in general upon the surrounding atmosphere may be regarded as pretty well settled, and we must all admit that by them the balance of nature and the integrity of the air is preserved, but we cannot forget that certain plants are notably injurious to the human race, and a still larger number under suspicion, and that still more, as yet unsuspected, may yet turn out to be hurtful in ways at present unknown. Then there is the question of the diseases of plants, house-plants being peculiarly liable to disease. That a very innocent disease of a plant may be a cause of a very serious disease in another plant is also known. Then there is the question of the sanitary condition of plant earth, the questionable soil in which they are potted, the more questionable but indispensable fertilizers, and the still more questionable fermentation and unseen growth in the damp and often sour soil. All these things and more are worthy of consideration before we rush wildly to the florist's rather than to the neighboring pharmacy when sickness breaks out in our families. Were the rosy view of the author to be applied, we should soon be prescribing carnation pinks and rhododendrons as freely as we now do pills, and the florist on the corner would grow in wisdom and pecuniary stature, while the patient apothecary would dwindle; polypharmacy would have its analogue in the polyflorist, who would order his flowers by the bouquet, and the worse the case the more the floral variety. The whole scheme of course needs practical development, but there is no doubt that the developer would appear, if he has not already. And where, then, would homœopathy be, and its sugar and its dilutions? The floral physician called to an urgent case, say of pulmonary hemorrhage, writes hastily and illegibly for ten monkey-flowers and a magnolia, with six lively pine-trees. The servant hastens to the florist, the florist's boy hastens back with a push-cart, and in a trice the plants are deposited by the bedside of the sufferer. She smiles feebly. The potent influence of properly-selected plant-life, assisted by the active remedial power of scientifically-applied plant perfume, does its work. She is saved! No nauseous doses, but "nature's own remedy," as the specific advertisements put it. How simple and touching, then, the position of the floral physician while the grateful family surround him and present him with the magnolia!

The florists will have qualified assistants, too, for mistakes may happen, and cast temporary discredit on the new system. The physician may order roses; the florist's ignorant clerk may send the tuberose; the patient

may die. All these things will, however, regulate themselves. The very thought of it all as a possibility seems to lift us above the sordid world of drugs, and though the vision may never be realized, we catch a glimpse of an elysium of practice, where the emancipated practitioner flits like a butterfly from flower to flower, and lives in a perpetual atmosphere of plant-moisture, perfume, and ozone. Ozone, ozone, how many theories have flourished in thy name!

The author of "House Plants" has carefully investigated the lives of florists. He finds that the greenhouse is a true sanitarium, and almost proves that the most deeply-seated tendency to phthisis may be eradicated, or held at bay, by leading a "florist's life;" but he also has discovered, or we have, from his account of his researches, that when once the business has been undertaken, it must be carried on to the end. There must be, literally, no looking back after putting one's hand to the plough or trowel, for to abandon the business is to invite death. Even to break a leg, and be kept out of the greenhouse for a few weeks, has been fatal. When such accidents occur, the sufferer, so far as we can see, must be treated in the greenhouse, surrounded by his favorite plants, boneset being probably the most beneficial.

The subject of house plants as sanitary agents involves indirectly the question of the relative value of dry and moist heat. The author argues in favor of a moist heat, which he would vary in its moisture to suit cases of different kinds; but so long as our winter catarrhs are contracted by the rough changes of temperature and by checked perspiration, so long will the transition from a greenhouse atmosphere to our out-door cold be injurious, and more liable to produce disease of the air-passages than a transition from the average dry air of our houses as ordinarily heated. Furnaces have much to answer for, but need not burn the air they furnish us, and need not disseminate the cellar air if properly fitted with cold-air flues. The air of a house should be still far from saturation, and be capable of rapidly drying perspiration from the surface of the body,—so dry that our clothing will be non-conducting, its interspaces being filled with dry air.

These few points of dissent, however, do not materially detract from the high estimate we have formed of Dr. Anders's work. The field is worth working, and so far we know no book on the subject of equal value. The author's style, too, is simple, forcible, and possesses the homely charm which always accompanies the writing of a true enthusiast, and we recommend all to read it, feeling sure that few will put it down without a positive increase of knowledge in certain lines likely to prove serviceable in their every-day work.

E. W. W.

SPINAL IRRITATION (POSTERIOR SPINAL ANÆMIA). By Wm. A. Hammond, M.D., etc.
Detroit, Mich.: Geo. S. Davis, 1886.

This is another number of the "Physician's Leisure Library." In it the author gives a careful history of the disease, with its literature. The opening sentence we quote: "Under the designation of 'spinal irritation' I described over twenty years ago an affection to which Americans, and especially American women, are liable to a greater extent than the people of any other country in the world." The eminent author, it will be observed, only described it "under the designation of spinal irritation." He did not invent the term, which he states "appears to have been first used by Dr. C. Brown, of Glasgow." The author's claim rests rather upon his theory of the cause of the affection being a posterior spinal anæmia, concerning which he says that it is better, when knowledge fails, to have some theory than none. His theory he supports by considerable argument, and in his subsequent pages gives us quite complete and graphic studies of the condition, its causes and treatment.

The treatment resolves itself primarily into blisters, which are most successful, and for rapid effect the actual cautery. Internally, he gives strychnine and phosphorus, coca, and general tonics. He considers it a manageable condition, susceptible of improvement generally, of cure often. The treatise is quite complete and useful, but contains nothing especially new at the present day.

E. W. W.

HANDBOOK OF PRACTICAL MEDICINE. By Dr. Hermann Eichhorst, Professor of Special Pathology and Therapeutics, and Director of the Univ. Med. Clinic in Zurich. One hundred and six wood engravings. Vol. II.
New York: Wm. Wood & Co., 1886.

The second volume of this work sustains fully the valuable characteristics which distinguish the first,—clearness, condensation, thoroughness, mark its pages. The condensation, complete absence of redundant words and sentences, complete absence of any style but the direct didactic, is remarkable, and the

time and patience of the reader are much economized. This volume, like its predecessor, starts upon a much higher plane of true scientific medicine than the average manual, or even complete monograph. Taking as an illustration of this the analysis of Part II., on "Diseases of the Œsophagus," we have a careful description, etiology, anatomical changes, symptoms, diagnosis, prognosis, and treatment of stenosis, dilatation, catarrhal and phlegmonous inflammation, corrosive inflammation, round ulcer, cancer, hemorrhages, perforation, spontaneous rupture, softening, spine paralysis, and spasm of the œsophagus.

The present volume contains also chapters on "Diseases of the Stomach, Intestine, Liver, Pancreas, and Peritoneum." The section on "Diseases of the Urinary and Sexual Apparatus" commences with a very valuable chapter on "Symptomatically Important Changes in the Urine." This is well illustrated, and fully describes the most recent tests as applied to the urine for the detection of albumen and other abnormal constituents. In this chapter, perhaps more than elsewhere, the condensation of the subject-matter is rather a hindrance than a help.

The author, among his general divisions of true albuminuria, makes one between permanent and transitory. The various relations of serum albumen, serumglobulin (paraglobulin), peptone, propeptone are discussed. The best test for serum albumen known, the author says, is the heat and nitric acid test. The ordinary test is described, and also Heller's test, and the acetic acid and heat test. Regarding picric acid, we quote the author's exact words: "If urine which contains albumen is filtered, and an excess of concentrated picric acid is added, a flocculent precipitate will be produced, or, if the amount of albumen is very small, a simple cloudiness." The author does not believe with Cooke and Watkins that picric acid will produce a precipitate in non-albuminous urine which contains quinine or potassium salts. He says, "Peptones can also be recognized with the aid of picric acid. They are also precipitated by the acid; but, unlike albumen, are redissolved by boiling or on the addition of nitric acid." The metaphosphoric acid test will also detect peptones in the same way. All these tests, the author says, "will not distinguish serum albumen from paraglobulin." The latter is detected by saturating the specimen with magnesium sulphate, when the resulting precipitate is paraglobulin. After filtering this out, the serum albumen is tested in the ordinary way. Propeptone: the urine is clear on boiling, cloudy when cold, if acetic acid or nitric be added, and clear again when warmed.

Chyluria is divided into tropical and non-tropical. In the former only has the filaria been discovered; in the latter "nothing is known concerning the genesis of the disease."

The author describes "Oxaluria" as a disease which exists in the minds of "English writers," and denies that there is such a "distinct disease of nutrition which leads to increased excretion of oxalic acid in the urine," and disposes of the matter by saying that it is observed after the ingestion of grape, spinach, celery, rhubarb, etc. The illustrations of "Diseases of Renal Parenchyma" are also full and excellent. Four illustrations exhibit the eye changes in renal diseases. The volume ends with a chapter on "Diseases of the Male Sexual Apparatus," and an appendix on "Diseases of the Supra-renal Capsule."

E. W. W.

A Practical Guide in Antiseptic Midwifery in Hospitals and Private Practice. By Henry T. Garrigues, A.M., M.D., etc.
Detroit, Mich.: Geo. S. Davis, 1886.

We have already had occasion to notice favorably several volumes of the "Physician's Leisure Library," among others the "Modern Treatment of Ear-Diseases," "The Use of Electricity in the Removal of Superfluous Hairs, etc.," and the two volumes entitled "New Medications." The great value of these publications, their handy and attractive form, excellent paper and type, and extremely reasonable price, twenty-five cents per volume, all commend them. They are new and original works of a high order, filling a place entirely apart from that occupied by other library and serial medical publications, and they deserve the widest recognition. The book of Dr. Garrigues on "Antiseptic Midwifery" is thorough and complete. And it probably often happens that the echo of what the great medical world is doing may be but faintly wafted to the rural practitioner, to his city brother immersed in the anxieties of general practice, and that, although the general facts are known to them, and perhaps the discussions of societies listened to and the published papers read, yet still they have but a faint and unreal idea of what perfect antisepsis is, in its recent adaptations. To such we especially recommend this work. It is a working manual. Any one possessed of average professional training can

easily and without expense practise it as well perhaps as the author. If any fail to realize its value, let them study Dr. Garrigues's book carefully, con his arguments, and read his results, and then calmly and dispassionately ask themselves whether it is not worth while to try it.

The argument that it is a good thing for hospitals but unnecessary for private practice is attacked by the author with great spirit and apparent success. He proves, or thinks he does, that under antisepsis lying-in is safer to-day in hospitals than it is in private practice without such precautions. He says, "Now the lying-in hospitals have become the safe places to be confined in." Of those who point to their thousands of deliveries without a case of puerperal fever he remarks, "Either their memory fails them, or they have a convenient definition of puerperal fever, in consequence of which puerperæ die of peritonitis, metritis, pneumonia, pleurisy, heart-disease, liver-complaint, kidney-trouble, meningitis, etc., but never of septicæmia." There is much force in the author's comment that if notes were kept of every case the mortality would somehow not be far from one in a hundred, and he thinks that the personal interests of the practitioner should be sufficient alone to force him to adopt the method of which he writes.

The expense and trouble of antisepsis when enforced among the poor in private practice are, the author thinks, very little. Ignorance rather than poverty is the opponent. The expense reduced to its lowest figure is carefully calculated, and amounts to one dollar and forty-four cents per patient, and this he considers is amply repaid in the diminution of necessary visits, the absence of protracted illness, and intercurrent complications.

But many who will decline to take what they consider useless trouble, if employed as a routine practice, would willingly avail themselves of the strictest antisepsis in special cases when confronted with the ominous symptoms of septic infection. The practitioner who has employed it daily will be familiar with its routine; but, if an inexpert, some such book as this will be invaluable to him, for the author possesses the happy, if rare, faculty of clearly describing all his procedures in the simplest and plainest language. The description of the minute treatment of a patient, showing diphtheritic wounds of the vagina after delivery, will give the readers a good idea of the author's power in this line. In short, while we are unwilling to enter on the question of the absolute necessity of so much care in all cases, none can doubt its value in special ones, and for this reason, if no other, we commend the book to all readers.

E. W. W.

THE PHYSIOLOGICAL, PATHOLOGICAL, AND THERAPEUTICAL EFFECTS OF COMPRESSED AIR. By Andrew H. Smith, M.D., etc.
Detroit, Mich.: Geo. S. Davis, 1886.

This volume of the "Physician's Leisure Library" contains a careful study of the effects of compressed air, as witnessed by the author while physician in attendance on the men working in the caisson employed in building the Brooklyn Bridge. As a practical study it is of great value, and may be said to afford the basis from which to estimate the value of the employment of compressed air therapeutically in the pneumatic cabinet and in other ways. The caisson was not devised as a therapeutic agent, and therefore is not liable to be under- or over-estimated. Dr. Smith has performed his part of observer and experimenter with great care and judgment, and his book deserves to be a standard authority on the subject. It is from such cases as he narrates, carefully studied as he has studied them, that great discoveries arise, and a leisure hour will be well spent in reading his carefully-written account.

A REFERENCE HANDBOOK OF THE MEDICAL SCIENCES. Edited by Albert H. Buck, M.D. Volume IV.
New York: William Wood & Co., 56 and 58 Lafayette Place, 1887.

We have already noticed in detail, as they have appeared, the previous volumes of this great and most useful publication. The present volume commences with the subject of "Ichthyol," and closes with a discussion of "Milford Springs." It appears to us to be in all respects equal to its predecessors, and confirms us in the opinion that, when completed, the "Reference Handbook" will furnish a most valuable book of reference to the general practitioner of medicine, giving him full and reliable information upon almost all conceivable subjects connected with the profession, and especially valuable for its full accounts of the various springs and health resorts of America. The illustrations are on a par with those of the other volumes. The lithographs comprise one representing test-tubes containing various growing bacilli, and showing quite well the peculiar characteristic forms of the colonies. This plate differs from most of its predecessors in having some prac-

tical value. On the score of æsthetic beauty we can commend Plate 17, which consists of various representations of carcinoma and sarcoma of the larynx. No amount of red and yellow ink has been spared in adorning this sheet of paper. If irregularity of outline, abundance of paint, and general hideousness of appearance can warm the hearts of subscribers, Plate 17 should be a success. Possibly it may be useful to some one, but such individual must be an extraordinary medical production.

HOT-WATER AND BEEF PLANS IN CHRONIC DISEASES.

This little book is an exposition of the peculiar method of treatment of chronic diseases devised by Dr. James H. Salisbury, now of New York City, who during the war of the Rebellion obtained notoriety by his alleged discoveries of the causes of measles, malaria, etc., discoveries which were founded on ignorance, but which for a few months obtained some acceptance through the credulity of the profession.

The present work indicates that the exponent of the Salisburian plan is no more learned than is its author. When we read that hot water washes down the "slimy yeast" of the alimentary canal, and that diseases of fatty degeneration and paralysis are due to the absorption of carbonic gas, we are enabled to diagnosticate the mental condition of the writer. Nevertheless usefulness attaches to the book, as revealing fully a method of treatment which was for a time "a rage" among certain people, and which in some cases really may be useful. Some physician whose statements are worthy of credence ought to go over the subject. We would very much like to know whether it is true, as is asserted in this book, that the sipping of half a pint of hot water of 110° to 150° Fahrenheit before each meal will cause the fæces to become black, and alter markedly the constitution of the urine. By the way, it seems to us that it must be a well-trained throat which can drink water of 150°, the high limit of the Salisburian plan.

We can testify from our own experience that in cases of feeble digestion the meat-ball, made by scraping the pulp out of a beefsteak, and forming a mass like a sausage-cake, and then broiling, affords a most excellent article of diet. The American meat-chopper, manufactured at Athol, Mass., makes a very excellent substitute for the case-knife and the hand, and makes it possible to prepare these meat-balls without much labor.

The directions for the use of these choppers and for the methods of cooking in the little book are good, but are unnecessary. The choppers themselves contain all the necessary printed directions, and any good cook ought to know how to broil a meat-ball after one or two trials.

A TEXT-BOOK ON SURGERY, GENERAL, OPERATIVE, AND MECHANICAL. By John A. Wyeth, M.D. D. Appleton & Co., New York, 1887.

The above work we have read, and will judge it from its title, viz., "A Text-Book on Surgery," or, in other words, a book to teach from; but may we not also look at it from the opposite side, and consider it a book to learn from? In answer to the first of these definitions, we do not hesitate to say that Prof. Wyeth has given us a most excellent book, one in which will be found all the advances of modern surgery and all that is good of older surgery. If at times the text is found too brief,—and from the scope of the work this must occasionally occur,—we have at least a suggestion, which may be further elaborated by referring to the more exhaustive encyclopædias or systems of surgery. The more important question to answer is in regard to the value of the book as a means of obtaining surgical knowledge, and, indeed, it is in this sense that the title of the work must be mainly considered. Again do we answer in the affirmative, and believe of the many text-books which are in use by the medical colleges, none are better, few are equal, and many are inferior; therefore we hope to see this work of Prof. Wyeth's recommended to those beginning the study of surgery, since we think a good foundation to build up a knowledge of the science and art of surgery may be found in it.

The question of surgical dressings is decided by Prof. Wyeth without any discussion, and we are also of the opinion that the time has now arrived when such discussions are unnecessary, believing, as we do, the final decision has been determined, and those surgeons who still obstinately, in the face of every-day facts, refuse to adopt antiseptic methods of treating wounds, are not practising surgery as a progressive science, and are not doing the best for the unfortunate patients who may place themselves under their care. The subject is, very properly by Prof. Wyeth, settled in a single paragraph, as follows: "This practice (antiseptic), which embodies the great principles of *cleanliness* and *carefulness* in surgery, is now so well

established among the best surgeons in America and Europe that any argument in its favor, as compared with the methods of one or two decades ago, I consider to be wholly unnecessary." The directions and various substances employed in order to carry out the antiseptic practice are briefly but satisfactorily given.

Under hydrophobia the author mentions the recent investigations of Pasteur, and states that this scientist claims he has "cultivated the specific germs of this disease, and through inoculations with the cultures immunity from rabies may be secured." This, we believe, is an error. Pasteur, so far as we know, did claim to have isolated the specific germ of hydrophobia, but later he denies having succeeded. While believing the disease to depend upon a specific germ, he has as yet never been able to demonstrate it, although many investigations were made in order to determine this question. The inoculations made by Pasteur on man, to prevent the development of this disease, have all been done with the spinal cords taken from rabbits, the latter having been inoculated from an animal said to have the disease transmitted to it by inoculation originally from a rabid dog.

The chapter on amputations has impressed us very favorably, and, with the author, we believe this surgical operation is becoming less frequent than before the antiseptic methods were employed. He writes "that in the present rapid advance in the science of surgery, and the great perfection in its art, the time is not far removed when amputations for other cause than gangrene will be comparatively rare." This is saying much, but when we look back and see what has been done, we cannot but anticipate a realization of the author's view. The methods of operating are concisely given, and leave no room for comment. Preference is given to the *solid-flap* method, viz., a flap composed of all the soft tissues lifted from the periosteum. The reasons why this method is to be preferred are stated by Prof. Wyeth as follows: "That flap will unite most readily, and prove most satisfactory, in the formation of which the normal relation of the skin to the subcutaneous soft tissues is least disturbed. It is always preferable to divide the skin, muscles, vessels, and other soft tissues squarely across and not obliquely, as must of necessity be done in forming flaps by transfixion. This method is applicable to most amputations." The illustrations showing the transverse sections of the extremities at different locations, which have been copied from Prof. Braune's work, add much to the value of this chapter.

The article on surgical diseases of the vascular system differs from the other portions of the work, in that we have in it not a text but a very exhaustive treatise upon the subject. This is explained by the fact that it was written for and appears in the "International Encyclopædia of Surgery," and it is a most able exposition of these lesions, but we think it would have been better if the author had made it conform to the other portions of his book, since it contains much that is not amiss in an encyclopædic article, in truth necessary for it, but could with advantage be omitted from his present work. The important operation of "ligation of arteries" has been presented in a most masterly manner, and we cannot speak too highly of this portion of the book; more especially are the illustrations, which are so necessary in order to intelligently and readily understand these operations, to be praised. They may be called beautiful; indeed, the only objection we can make is that the artist has given us a too charming picture. To see the vital regions of the neck exposed by a most minute dissection, and have the face presenting a smiling, happy expression, the eyes open and sparkling with pleasure, is very pretty, but, in truth, unnatural.

Fractures are presented to us with all the modern and best methods of treatment. The directions given to properly obtain a favorable result in these frequent lesions are such as we can fully concur with, making, however, an exception in that of fracture of the femur. The choice is given between extension and the plaster of Paris dressing, and preference given to the former. In our opinion there is no choice, believing, as we do, that there is but one method, viz., extension; and to sustain this we quote the late Prof. Hamilton, who wrote as follows: "The plaster of Paris is not a safe or judicious dressing for fractures of the thigh, either for fractures through the shaft or for fractures near the upper or lower extremities of the bone, for fractures in children or in adults, for compound or simple fractures." We notice that Prof. Wyeth strongly condemns the recently introduced method of treating fractures of the patella by opening the joint and wiring the fragments together. This procedure is also in our opinion a rash, dangerous, and uncalled-for method, and we believe with the author, who says, "A careful observance of the rule of practice just laid down will secure a liga-

mentous union, with a restoration of the function of the extremity, equally as good in many cases as that enjoyed before the injury, and in the vast majority of cases equal to all the ordinary requirements of the limb, and this is accomplished without the slightest risk to the patient's life. . . . On the other hand, although an osseous union may, in the majority of cases, be obtained, the restoration of function is not more complete, the confinement to bed is longer, and the danger to life and the integrity of the part sufficiently great to deter the surgeon from employing this method (wiring) of practice."

Prof. Wyeth is not yet willing to accept the views of most German and some French surgeons in regard to the etiology of non-traumatic ostitis. He admits that tuberculosis is frequently a cause of ostitis, but thinks the non-tubercular form to be more frequent. Our own experience and reading upon this subject would incline us to the tubercular side of the question; at least we believe many obscure cases are better explained by this view than by any other. The directions given for performing exsection of the knee-joint, especially the use of the author's drills, to transfix the bones, are to be recommended. The chapter on abdominal surgery is well abreast of the period, and advocates, or at least describes, the various operations which have within the past few years been proposed, some of these, in our opinion, being nothing more than ante-mortem dissections, and as such should find no place in surgery. The reasons in favor of operative interference in wounds of the abdomen, given by the author, are quite convincing, and only further confirm our own views in regard to this method of treatment. He says, "1. The enlargement of a wound sufficiently to demonstrate its opening (or not opening) into the cavity of the peritoneum is a simple procedure, practically without danger. 2. Abdominal section is not difficult, nor, when skilfully and properly performed, a dangerous operation. 3. A penetrating wound of the abdomen, left without surgical interference, is attended always with great danger. 4. If any vessels of size are divided, hemorrhage is an immediate danger, and peritonitis a serious and probably fatal complication. 5. If the alimentary canal is opened, death is almost inevitable. The few recorded cases of recovery form such an infinitesimal proportion of the whole, that they should carry no weight against interference."

The descriptions of the surgical lesions of the genito-urinary organs and their treatment are somewhat brief, but all essential points are included in the context. Venereal diseases have received due attention, and a rational method of treatment is advised; syphilis being properly considered a curable affection, provided suitable medication and sufficient time are given to its treatment. In the treatment of stricture of the urethra, internal urethrotomy is advised, as being better adapted to most cases, in so far as the chances for a permanent recovery are reasonably good. This opinion we are in accord with, but our practice in the treatment of this lesion has been first to employ gradual dilatation, and if all symptoms disappear in a reasonable time, no more is done; that there will not be a return of the trouble we cannot foretell,—probably sooner or later there will; however, we think in some cases there has been no further difficulty. We have at least given an opportunity for mild means to overcome the disease. If not successful, we then resort to more severe measures, and perform internal urethrotomy, after the method given by the author, which is essentially that introduced by Otis. The concluding chapters, on deformities and tumors, are in keeping with the rest of the book, and ably represent the modern methods and views in regard to these lesions.

Prof. Wyeth is certainly to be congratulated for the manner in which his publishers have done their part. The illustrations, the paper, the typography, and in fact the entire work may be regarded as a beautiful specimen of the art of book-making. J. H. C. S.

Correspondence.

BERLIN.

(From our Special Correspondent.)

In accepting with pleasure the invitation of the THERAPEUTIC GAZETTE to furnish its readers, in a series of letters, a *résumé* of the scientific life and activities of the German capital, it is my purpose first to describe briefly the condition of medicine in Berlin.

The centre of scientific ambition in Berlin is the University, of whose four faculties the medical only is at present pre-eminent.

This faculty is, however, the most distinguished in Germany. We need only mention the names Virchow, DuBois-Reymond, Helmholtz, Leyden, Gerhardt, Von Bergmann, Waldeyer, Liebreich, Schroeder, Gusserow, Westphal, Robert Koch, to recognize those upon

whom depends the fame of this celebrated institution. The most important of the subdivisions of the medical department of the University are the Pathological Institute, the Department or Institute of Physics, the Physiological Institute, the two Clinics of Internal Medicine and the Clinics of Surgery, the Anatomical and Pharmacological Institutes, the two Obstetric Clinics, the Clinics for Psychiatry, the Hygienic Institute. From these have emanated the conclusions drawn from researches which have influenced the medical knowledge of the world. The principal instructors hold the positions of directors of the institutes and clinics; the latter, excepting some which occupy new buildings especially constructed for them, are held in the oldest hospital in Berlin,—the Charité.

There are in addition a large number of hospitals which afford material for study and publication. Among these are the two large city hospitals, the Friedrichshain and the Moabit. A second nucleus of medical life are the medical societies of Berlin, the chief of which is the Berlin Medical Society, with Rudolph Virchow at its head: it numbers over six hundred members. Next in importance is the Society for Internal Medicine, with Leyden and Gerhardt leading its clinics. The surgeons meet in a "full assembly," which meets monthly, generally at the clinic or hospital wherever there may be an interesting case for demonstration. In addition there are the Gynæcological and Obstetrical Societies, the Society for Hygiene, the Society for Psychiatry and Nervous Diseases, the Physiological Society, the Society for Dermatology, and the Society of the Physicians to the Charité. All meet weekly, fortnightly, or monthly, and number from fifty to three hundred members. In these meetings there are valuable scientific discussions, and I shall have frequent occasion to revert to them in future. The official accounts of these societies are published in the special *Archivs*, and the monthlies of the Berlin Medical Society, of the Society for Internal Medicine, in the *Berliner Klinische Wochenschrift*, and the *Deutsche Medicinische Wochenschrift*, two of the most important of German medical publications, and edited in Berlin. In addition to the four societies mentioned, there are in Germany a number of associations which include the societies of the empire. Aside from standing societies which do not come within the scope of these letters, as taking place in the first rank of these is the Society of German Naturalists and Physicians, which meets yearly in different places of Germany, and whose discussions open a wide field. Next in importance are the Congress of Surgeons, which meets in Berlin yearly, and the Congress for Internal Medicine, whose place of meeting is Wiesbaden. Accounts of the proceedings of these three great societies will be included in my letters.

It will be of interest to know that Professor Ehrlich, assistant in the clinic of Professor Gerhardt, has recently treated a number of cases of typhoid fever which occurred in the clinic with thallin, with most beneficial results: the details have been given in the medical journals. Following the results obtained in the clinic of Professor Leyden, antifebrin has been used with good results in acute joint-rheumatism by Müller in Gerhardt's clinic. He gave 30 grains daily for several days, and observed in some cases the cyanosis which Cahn and Hepp have reported. A moderate degree of uræmia was observed in some cases, and spectroscopic examination of the blood showed a methæmoglobin line. On shaking the blood with air the line did not disappear, showing that a portion of the coloring-matter of the blood was unfit to be oxidized by respiration. The blood examined was light brown in color. After the withdrawal of the drug a trace of the substance remained for several days. Müller concluded that a portion of the antifebrin became anilin in the body, and as such was injurious.

At a meeting of the Society for Internal Medicine, January 10, Dr. Harrlich, assistant in Leyden's clinic, spoke of salol, as recommended by Nencki and Sahli. He had used the drug in twenty-three typical cases of acute joint-rheumatism, in some cases of chronic joint-rheumatism, in a number of cases of acute muscular rheumatism, and in the doses given by Sahli—℥iss to ℥ii—he had observed favorable effects following its use, and he had been led to believe that the carbolic portion of the compound drug was of especial value, as the results indicated a greater potency than could be attributed to salicylic acid alone. The drug was well borne, without inconvenient after-effects. It was given in powder, in wafers or tablets, 30 grains at a dose. Salol did not prevent endocardial complications or relapses; it was especially useful where high temperature was present, as is true of all antipyretics in rheumatism.

In a meeting of the Berlin Medical Society of January 19 Dr. Bidder described his method of aborting furuncles, a subject not new in literature, but regarding which extensive ob-

servations have not developed a fixed plan of treatment. Bidder began his treatment in 1875 with one hundred cases, which gave favorable results. His plan consists in the injection with a hypodermic syringe of a two per cent. solution of carbolic acid obliquely into the furuncle at one side; a second injection is made upon an opposite side; both go to the centre of suppuration. A few drops are given each time. In addition a compress wet in carbolic solution is placed over the furuncle, and when this cannot be used mercurial plaster is substituted. A repetition of the injections is not generally needed, and is not thought desirable. Furuncles so treated do not generally open, but are dissipated. In small furuncles the injection of a few drops suffices; in the larger ones two injections of half the contents of a Pravaz's syringe were enough; in the largest, as large as half a human hand, four injections of half or the whole syringe were given. When a condition of furunculosis was present, as sometimes occurs in diabetes mellitus, constitutional treatment was imperative. In contrast with the foregoing, Dr. Bidder treats felons by incision.

Dr. Lassar stated another method of treating the same affection. Recognizing the fact that the skin over the centre of a furuncle is thin, and that through this skin access is obtained to the pus beneath, Lassar has used very small spoons, as large as a needle, which have enabled him carefully, and without giving pain, to remove the contained pus from the centre.

PARIS.

(From our Special Correspondent.)

Salicylated Aliments before the Academy of Medicine.—The fact that the French Academy of Medicine has condemned the use of salicylic acid as a preservative of aliments is probably now well known; but the reasons which led to the decision are scarcely less important than the decision itself. They were elicited during the debates preceding the vote on the committee's report, and deserve careful consideration.

Dr. Constantin Paul, when the report was read, first entered the lists by breaking a lance in favor of salicylic acid. Admitting the occasionally untoward effects of the acid and its compounds when administered in therapeutic doses, he denied their danger in small quantities. He quoted the experiment of Dr. Kolbe, the discoverer of the artificial acid, who took for thirteen months 1 gramme (15½ grains) of salicylic acid every day without being inconvenienced, that of Dr. Lehman with ½ gramme daily, and others related by Raynaud and Oulmont. Dr. Constantin Paul's conclusion was that salicylic acid is an excellent and harmless preservative of aliments; that if its use be forbidden the aliments now preserved by its help will reach the consumer in a spoiled condition, and that it is better for the public to partake of salicylate than of spoiled aliments. In consequence, he was in favor of strictly limiting the proportion of acid allowable. From the start Dr. Paul was evidently at a disadvantage, having to prove a negative proposition, namely, that salicylic acid is not dangerous.

Dr. Vallin replied that if few accidents due to salicylic acid have so far been observed, it is because physicians have not looked for them. When they have a dyspeptic patient, how often do they examine his aliments or his urine for salicylates? If there were distinct symptoms of intoxication, perhaps attention might be awakened. But we often see even such characteristic affections as chronic lead-poisoning mistaken for anæmia or cachexia, until some keener observer notices the blue line on the gums, showing the real cause of the trouble. The danger of salicylates is greater for valetudinarians than for persons enjoying robust health. If their use is tolerated at all, everything we eat and drink will contain some of the chemical, for it is a great deal cheaper to preserve a twenty-five-gallon cask of wine or beer with ten grammes of salicylic acid worth four cents than to employ sufficient care, cleanliness, and good materials in the manufacture. The same remark applies to other aliments.

Dr. Constantin Paul admitted that care, cleanliness, and good materials are preferable to salicylic acid, but maintained the innocuity of the acid, since there are no positive records to the contrary.

Dr. Brouardel now taking the floor, said he had made some personal experiments throwing light on the subject. Having alluded to the acknowledged danger of salicylic acid to aged persons, or those suffering from impairment of the renal or digestive functions, he related the following results arrived at in experiments made by Dr. Bouchut and repeated by himself: "When a small dose of salicylic acid, say 20 centigrammes (3 grains), is daily administered to a young man of 20, a man of 50, and an old man of 70, on testing the

urine the characteristic reaction of salicylic acid will not be detected in the first specimen because the acid is transformed in the economy as it is absorbed; the same thing will often occur with the second, but never with the third subject. The acid will be still present in the urine of the third—the old man—several days after the administration has ceased. Hence it follows that if the dose be kept up for some time, salicylic acid will accumulate in the economy, and, in case of renal lesions, serious accidents may result. It is difficult and often impossible to determine the cause of such accidents, because they resemble so much those due to cerebral or gastro-intestinal troubles, and I incline to think the evil is of more frequent occurrence than is generally believed. Within the past ten years my associates and myself have made more than three hundred post-mortems at the morgue in cases of sudden deaths. In more than one-half of them death had been caused by arterial sclerosis, and often the renal lesions due to this disease had occasioned the suddenness of the death by impeding the elimination of alcoholic beverages and even medicines administered. The symptoms observed during life, viz., coma, convulsions, cephalalgy, etc., had rendered the inquest necessary. I do not mean to say that salicylic acid had killed these patients, yet I cannot believe that the chemical would have been free from danger to them, and I am so much the more of this opinion because the slightest excess for such subjects, a bottle of champagne, for instance, is sufficient to cause death. Still, I would not for this reason forbid the use of champagne."

Dr. C. Paul. "Such would be the logical conclusion."

Dr. Brouardel. "Not at all, because when you drink a bottle of champagne you know what you are doing, and when you swallow salicylic acid in your food you do not know it. The danger lies in the underhanded addition. If salicylating be allowed, there will be no limit to the dose absorbed in a day. All aliments, solid as well as liquid, being liable to have their little seasoning with salicylic acid, a man may very easily in this way take from one to two grammes in twenty-four hours. And those who are the most affected by the acid are the very ones whose kidneys cannot eliminate, and thereby will not show the presence of the dangerous chemical. It must not be forgotten that every year fifty tons of salicylic acid are sold and used for preserving alimentary substances. Here is a real danger against which the Academy should protest by adopting the committee's conclusions."

The committee's report was, of course, concurred in by a large majority,—nearly a unanimous vote.

Dangers of Santonin.—Dr. Laure, at a recent meeting of the Lyons Medical Society, related an interesting case of santonin-poisoning. On December 25 last he was called to visit a child 3½ years old. The parents attributed the evident intoxication to some black lead which the child had daubed over his lips. As black lead, notwithstanding its name, consists of nearly pure carbon and contains no lead, the case was somewhat obscure. The patient was lying on his back, in a state of deep prostration, now and then interrupted by sharp cries. The child then would bend up its knees, and place its hands on its abdomen, apparently the seat of the pain. This fit over, he would fall again into the former somnolence. The face was of a livid paleness, the pupils dilated, breathing frequent, the pulse rapid and irregular, while the rectal temperature remained below 37° C. (98.6° F.). The stomach would immediately reject anything ingested.

Matters passed by the patient after the administration of a purgative enema, advised by the family pharmacist, showed nothing abnormal, excepting the deepened coloration of the liquid portions, and this was at first attributed to the drugs themselves from which the enema was composed.

On the whole the symptoms were very perplexing, when the mother, on being interrogated again, remembered that *two days before* she had given the child a dose of 10 centigrammes (1½ grains) of santonin. She even had a second powder like it, but, fortunately, did not administer it. It appeared, also, that the day before calling in the physician the child had passed what the parents thought to be bloody urine. This color, Dr. Laure thinks, was simply due to santonin, as Wood states it to be the case finally.

Perhaps the worst symptom was the complete retention of urine, none having been passed within twenty-four hours. But once the case was clearly understood, the treatment was easy and the recovery rapid. A warm bath and a laxative enema restored the flow of urine, and a copious passage relieved the abdominal tympanitis. In a few days the patient was well again.

This custom of dosing children with santonin seems to be a common one with the

French working classes. As soon as the little ones have the slightest diarrhœa caused by teething, some parents conclude they have worms, and give them the medicine without any medical advice. Besides, they administer it simply powdered, without adjuvants or correctives.

As regards the dose of santonin, Dr. Laure thinks the rule laid down by Benzinger, viz., as many grains as the child has years, four days in succession, is one that should be regarded with suspicion. He prefers Wood's advice,—not to exceed one grain for a child less than two years.* Dr. Laure is also of opinion that it is very desirable to combine santonin with a purgative; calomel, for instance. As to the antidotes of santonin, ether, and especially chloral, have been recommended as the best by Becker and Binz. In a case when convulsions or nervous troubles occur, they would have been used willingly. But in the case just narrated it was thought more advisable to facilitate the elimination of the poison by the kidneys and bowels, and afterwards to administer tonics.

Sulphate of Zinc in Epsom Salt.—The appearance of magnesium sulphate resembles so much that of zinc sulphate that there is always some danger of the two salts becoming accidentally mixed together. A little sulphate of magnesium in a sulphate of zinc lotion would probably matter but little. In a dose of Epsom salt, on the other hand, 10 or 15 grains of white vitriol are exceedingly undesirable. A very simple test, recommended by M. Machelart, a pharmacist of Lille, will obviate all danger from this cause. It consists in the addition of ferricyanide of potassium to a solution of the suspected sulphate. Pure sulphate of magnesium is not affected by the test, while sulphate of zinc affords a dirty yellow precipitate that can be noticed even when only two per mille of the contamination is present. As red prussiate of potash is to be found in most pharmacies, it is easy to thus prevent the occurrence of accidents, or rather their recurrence, for it seems they have happened before.

Unexpected Death of Prof. Béclard.—Dr. Jules Béclard, a professor of physiology at the Paris Faculty of Medicine, and the dean, or president, of the Faculty, died on February 9, after an illness of only eight days, at the age of but little over sixty-eight years. His father, who was a native of Paris, like the son, and a professor of anatomy at the Faculty of Medicine, died when Jules was but seven years old. The widow later on married Dr. Ferrus, also a professor, by whose advice young Béclard applied himself to the study of mental diseases, and became an interne at the Charenton Hospital. But on obtaining his diploma he preferred physiology, anatomy, and laboratory investigations. Having become an *agrégé* (fellow of the Faculty) in 1844, he lectured on anatomy and physiology from 1845 to 1859, and afterwards devoted himself to original researches. He was elected a member of the Academy of Medicine in 1862, its perpetual secretary in 1873, and dean of the Faculty in 1882. Dr. Béclard's writings are numerous and important. For years he was connected with the *Gazette Hebdomadaire*, *Archives de Médecine*, Dechambre's *Encyclopédie de Médecine*, etc. His treatise on "Human Physiology," published in 1855, is now a classical work in the hands of most students. Among his other publications the following may be quoted: "Système Cartilagineux" (1864); "Eléments d'Anatomie Générale," by his father, a new edition (1851); "Hygiène de la Première Enfance" (1852); a translation, with Dr. Sée, of Kolliker's "Treatise on Human Histology," from the German, etc.

PARIS, February 18, 1887.

CHEMICAL FEEDING.

(From an Occasional Correspondent.)

To the Editors of the THERAPEUTIC GAZETTE:

SIRS:—The spirit of self-sacrifice with which American physiological chemists, so called, are endeavoring to build up the failing digestion of the American people is one which needs no commentary or laudation on my part. Its fruits speak for themselves. Are not their praises, or, at least, their taste, in everybody's mouth? What with pepsin, pancreatin, extract of pancreas, papoid, beef extracts, peptonoids, peptogenic powders, condensed milks, juices and extracts of fresh flesh, health foods, gluten bread, and compounds, principles, extracts, and adornments too numerous to be mentioned, the suffering Americans are in a fair way to be sustained in their vital functions, and there is reason to hope that the time will come when, the gynæcologists having removed all the abdominal organs, the lightened body, artificially fed,

* It must be borne in mind that when modern French writers use the term "grain," which, fortunately, they seldom do, they mean five centigrammes, while the English grain is equal to about six and one-half centigrammes.

may go on its way rejoicing through years of usefulness.

Of all these remedies, I would like to call the attention of your readers especially to peptonoids, of which the most recent addition is lobster peptonoids.

"Lobster peptonoids" represents the very flower of chemical research. Beef, mutton, pork, and chicken peptonoids, Thanksgiving peptonoids of turkey, Western peptonoids of bear and buffalo meat, the Southern (colored) "'possum peptonoids," but the invaluable lobster peptonoids languish for want of a suitable introduction. By a true flash of genius it is brought to our notice in a series of diet tables or leaflets, whereon are printed the regulation diet for the different diseases. The diet tables are originally, "as revised by leading physicians in Australia and New Guinea," quite free from suspicion, and represent the accumulated wisdom of the profession. All that the inventor of lobster peptonoids had to do, in order to render them worthless, was to print on each leaflet, in a prominent place on the list, "lobster peptonoids." We do not deny the value of these peptonoids, but it is hard to believe that they are so universally valuable in every disease. In some diseases, notably in cholera infantum and varicella, they have undoubtedly achieved great results, especially when associated with terrapin peptonoids. There is the direct argument of common sense for their use, since both lobster and terrapin are water-fowl, and cholera infantum is characterized by watery discharges, and varicella by a watery eruption. Even in gonorrhœa, which affects the water-passages, and in cystitis they might be tried with some hope, and in ascites, but we must protest when we find them recommended in such serious and prevalent diseases as scabies and parotitis.

When the products of real digestion are suspected, under slight deviation from the normal, of becoming deleterious, when a man may be actually poisoned by the products of his own digestive apparatus, it beseems us to be cautious in employing these new peptonoids. Already pepsin, time-honored pepsin, is under "suspicion of blood-poisoning." It always had a guilty smell, like old anatomical specimens, and an ancient and corpse-like taste, but the world took it at our valuation, a sign of that childlike confidence that the world has always displayed towards us. But now men and manners are changing, and as men no longer take theology from the priest without gainsaying, soon they will hew out for themselves new systems of medicine and pharmacy. Where, then, will the lobster peptonoids go but into the world's lumber-room, with celery and coca, cerebro-stimulators, liquid foods, "each teaspoonful representing a pound of steak, one chop, six eggs, and half a dozen raw oysters, with a loaf of stale bread," and the thousand and one *quasi* remedies which chemical and pharmaceutical ingenuity devise and force upon us daily and hourly, which cover our desks and tables, are thrust upon us by overzealous agents, and even steal insidiously upon us through the daily post. They fill and distract our waking and sleeping hours till they crowd out the ancient, established, and valuable remedies, tormented and perplexed by the cloud of phastasmal ones which encircles us. And not only us, but the general public, for their circulars flutter on the door-steps of private residences, and come by mail to citizens guiltless of medical knowledge, all extolling the marvellous effects of their elixirs, their nerve invigorators, their wonderful newly-discovered tonics. It will soon be a necessary rule never to employ a remedy so introduced, even though by so doing we shut the door on that most invaluable preparation, the "lobster peptonoids."

URTICARIA FROM INDIGESTION.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—Will you, or some of our scientific men, tell me why it is that indigestion, characterized by burning in the stomach, with sour or bitter eructations, after meals, will cause an intolerable itching, generally, of the whole cutaneous surface between the knee- and ankle-joints, but sometimes in spots, and nowhere else? I have been applied to occasionally, for the last eight years, by men of middle age, for treatment of this trouble. I had several cases before I suspected the cause, and was not thoroughly satisfied till, experimenting upon myself, I found that a cup of strong coffee three times a day, or a tablespoonful of distilled liquor for two days, would make my legs itch so that I could find no rest till I had thoroughly rubbed with table-salt, and then I sometimes use carbolated glycerin. The rubbing with the salt is a perfect luxury. As before said, it is confined to men of middle age; have never found a case of it in the opposite sex. Now, what I want to know is, why this disturbance of the stomach is telegraphed by the nervous system to this distant locality and nowhere

else? I ask for information, private, or, if you think best, through the columns of the GAZETTE.

Yours, etc.,
R. L. HINTON.

PRESCOTT, ARK.

[It is perfectly well known by every practitioner that gastric or gastro-intestinal irritation will produce urticaria and other dermal eruptions or irritations. There is, therefore, nothing novel in the experience of our correspondent. He is mistaken in supposing that the thing is confined to men, or is more frequent in men than in women, excepting in so far that men more frequently overindulge themselves in the pleasure of eating and drinking than do women. The skin-trouble is undoubtedly produced in many of these cases through the intervention of the nervous system, the irritation of the gastric nerve being reflected to the distant surface of the body. In some cases, however, there is probably absorption of a poison produced in the fermenting mass in the stomach or intestines. In other instances the gastric irritation and the disorder of the skin are the results of a common cause. The symptoms detailed by our correspondent are especially apt to occur in gouty people, in whom a little excess at the table will provoke an outbreak of acid dyspepsia, which is largely the expression of a gouty condition in which the tension is habitually so great that a little more irritation provokes a gouty discharge. In the great majority of cases a pruritus is gouty, but when occurring in middle-aged women, it may be a climacteric phenomenon.—EDS. THER. GAZ.]

POTASSIUM BROMIDE IN SALIVATION.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—In a late issue of your valuable journal I read an article recording Dr. Schunn's experience in the use of potassium bromide in salivation. In an article of mine published in the *New Orleans Medical Journal*, I mention the use of this medicine in a case coming under treatment during the month of June, 1885, also stating that I had treated cases of like nature with it during severaly ears.

I especially remember writing concerning a case of nursing sore mouth, complicated with excessive salivation, resisting treatment until I put her on this remedy, locally and internally. I was gratified in making a complete cure, and believe any case, neurotic or reflex, will be benefited, and many cured, by its use. I have also found it as efficacious in relief of painful dentition as a certain much-vaunted French remedy, and much cheaper.

Yours truly,
A. PARKER CHAMPLIN.

BAY ST. LOUIS, MISS., February 24, 1887.

Notes and Queries.

INCOMPATIBLE PRESCRIPTIONS.

The following examples of untoward results following the combination of familiar prescriptions are given in the *Deutsch-Amerikanische Apotheker-Zeitung* for January 15, 1887, as original with Ch. T. P. Fennel in "The Principles of Pharmacy." While these incompatibilities may be well known, yet their repetition as a reminder will not be devoid of interest.

A common and dangerous action is that resulting from the mixture of alkaloids with alkalies or alkaline salts, of which the following is an example:

℞ Strichninæ sulphat., gr. ss;
Elixir. brom. chloral., ℥viii. M.
Sig.—A teaspoonful morning and evening.

The result of this mixture is a colorless solution, from which is deposited in a few hours a crystalline precipitate, which is the greater portion of the strychnine ordered. Although the elixir is not officinal, it is frequently prescribed, and its potassium bromide will deposit the strychnine as an insoluble bromide. The last dose taken, unless great care to shake the mixture well was observed, would result disastrously.

The following prescription may also result badly:

℞ Morphin. sulphat., gr. ii;
Liq. ammon. acet., f℥ss;
Aqu. destillat.,
Syr. simpl., aa f℥ii. M.
Sig.—Teaspoonful doses as ordered.

When the diluted acetic acid has been neutralized, and an excess, although not great, of ammonium carbonate is present, the precipitation of the alkaloid will result as in the first instance.

The following may also prove incompatible:

℞ Potass. iodid., ℥i;
Spts. æther. nitros.,
Aquæ, aa ℥i. M.

When the spiritus ætheris nitrosi is not

free from nitric and acetic acids (a result which is produced by the action of the air) iodine will be set free, and a colored solution take the place of a colorless one. The chemistry of the decomposition of the spiritus ætheris nitrosi is as follows:

$$2(C_2H_5NO_2) + 3O_2 = 2(HC_2H_3O_2) + 2HNO_3.$$

A familiar example of decomposition occurring in the organism when chemical substances are given is found in the simultaneous use of calomel and potassium iodide, as follows:

℞ Hydrarg. chlor. mit., gr. iv;
Sacchar. lactis, gr. x. M.
F. pulv. No. 10.
Sig.—A powder three times daily.

Also

℞ Potass. iodid., ʒi;
Aqu. destillat., ʒiv. M.
Sig.—Teaspoonful every three hours.

A reaction between the calomel and potassium iodide occurs in the stomach, and bad results, through the irritating mercurial formed, may occur.

An explosion or unfortunate formation of gas may result from this prescription:

℞ Ammon. carbonat., ℈ii;
Syrup. scillæ, fʒi;
Syrup. senegæ, ʒi. M.

The acetic acid in the syrup of squill has been overlooked in this combination: its union with the ammonium salt would result unfortunately through the liberation of carbonic acid gas.

In those cases where ingredients are ordered which even in a measure tend to produce insoluble compounds, the ingredients should be diluted as much as possible, that the resulting coagulum or compound may be easily dissipated by shaking. This is illustrated by the prescription—

℞ Liq. ferri chlorid., ʒiss;
Muc. gum. arab., fʒi;
Aqu. destillat., fʒiv.;

in which the iron and mucilage should both be diluted before mixing.

The same caution obtains when tannin or liquiritia is combined with metallic or alkaloidal salts.

℞ Extr. hyoscyami aq., ʒss;
Tinct. valerian., ʒiii;
Spir. ætheris nitrosi, ʒvi. M.

In the above the extract is to be diluted before mixing with the spiritus ætheris nitrosi.

The prescription

℞ Tinct. iodin., ʒi;
Aquæ, ʒi. M.

will result in the separation of free iodine; to prevent this potassium iodide should be added.

The prescription

℞ Potass. chlorat., ℈i;
Acid. hydrochlor., ʒii;
Aq. destillat., ʒx. M.

results in different ways. If the potassium chlorate is immediately added to the acid, and then water mingled with the resulting fluid, chlorine gas is formed in solution. If the potassium chlorate is first dissolved in water, and then the acid is added, free chloric acid results.

A NEW "CURE FOR CANCER."

Dr. Velloso lays claim to having cured several cases of epithelioma of the face and lips with the juice of alvelos, a plant which belongs to the family of Euphorbiaceæ. It acted as an irritant, and destroyed the diseased tissue, which was quickly replaced by healthy granulations. Of the three different kinds of alvelos (male, female, and wild), the second is considered the most efficacious. It is found at Pernambuco, and although the natives have employed the juice for some time, it has not come into extensive use on account of the severe pain which it causes. The best results were obtained with the juice in a concentrated solid form, and with the addition of vaseline or lanoline. This preparation should be applied with a brush to the affected part (previously washed with a solution of carbolic acid), which should then be left exposed to the air for at least an hour. It should afterwards be covered with lint. This treatment should, as a rule, be repeated every two or three days, and never more than once in twenty-four hours, as the pain of the application is severe. The treatment was more speedily successful when begun before ulceration had occurred.—*British Medical Journal*, January 1, 1887.

ADONIS VERNALIS IN HEART-DISEASE.

Dr. J. G. Herrmann, of St. Louis, writes us that he has recently had considerable experience with the use of adonis vernalis in cardiac affections. He believes that his experience, which has extended over ten months,

warrants his statement that, while free from the evil effects of digitalis, infusions of adonis vernalis are quite as efficacious as that drug. He prescribes it in the form of an infusion, of the strength of three drachms of the herb to six ounces; of this he gives a tablespoonful every two hours. He refers to several cases in which this drug proved successful even after digitalis had failed. One was a case in which the feet were highly œdematous, and there was general anasarca from heart-lesion. In two weeks of treatment with the infusion of adonis vernalis every two hours, in tablespoonful doses, almost perfect relief was secured. So also he states that he has caused great relief to a case of ascites, produced through heart-disease. He noticed that it increased the fulness of the pulse and strengthened the cardiac pulsation. In asthma also he has combined it with quebracho with very satisfactory results.

The following are some of the prescriptions which he has employed:

℞ Fl. ext. adonis vernalis.
Sig.—From 2 to 6 drops, as necessary.

℞ Fl. ext. adon. vernal., f℥ss;
Syr. menth. pip., ℥vi.
Combined as desired sometimes with brom. sodium and tr. opii camph.
Sig.—℥i to ℥i every two hours daily.

In asthma:

℞ Fl. ext. adonis vernalis, ℥ss;
Fl. ext. quebracho, ℥ii;
Tr. opii camph., ℥ii;
Syr. menth. pip, ℥vi. M.
Sig.—℥i every two hours.

HYSTEROGENIC ZONES ON THE MUCOUS MEMBRANES OF HYSTERICAL SUBJECTS.

Dr. L. Lichtwitz, of Bordeaux, following up the researches of Gaube on hysterogenic zones on the external surface, and of Blan-Fontenille on lethargogenic and lethargo-inhibitory zones in hysterical subjects, has shown that not only the external, but also the mucous, surfaces of the body present in certain hysterical subjects areas the touching of which induces attacks either of a convulsive or a hypnotic character. This may be important in case examination with the nasal speculum, the laryngoscope, or other instruments is required. In some cases it was found that even cocaine did not prevent an attack. Dr. Lichtwitz points out the importance of knowing the spots where inhibition or arrest of convulsions can be produced, in case of the accidental induction of an attack. According to his observations, there is no accessible part of the mucous membrane which may not be the seat of "hysterogenic zones," the most usual place being the nares. In one of his cases, one side of the nostril evinced spasmogenic and the other lethargogenic properties.—*British Medical Journal*, February 12, 1887.

STOMACH DIGESTION.

Opportunities for studying gastric digestion through fistulous openings into the stomach are, thanks to modern surgery, more frequent than formerly. This is important, as the physiology of digestion, as understood at the present day, requires more than the classical instance of Alexis St. Martin to place it on a sound experimental basis. Such a case with experiments *ad hoc* is recorded in the *Revue Scientifique* by Von Herzen, of Lausanne. The subject was a man, æt. 28, on whom gastrostomy had been performed for occlusion of the œsophagus. The observations made were as follows: Bile always appears in the stomach during digestion, but generally only in the later stages. The amount of HCl amounts to 1.8 to 1.9 grm. pro litre; it increases during digestion and reaches its maximum in the third hour. Sodium chloride appears rather to diminish the amount of acid. When the stomach was empty in the morning but little pepsin was found, and a large amount of propepsin; peptogen accelerated digestion. In the first hour, of a quantity of albumen introduced, two per cent. was digested without peptogen, twelve per cent. with it. In the second hour, twenty-three per cent. was digested without, forty-five per cent. with peptogen. In the third hour, fifty-one per cent. without, seventy-six per cent. with, peptogen. These results agree with those obtained by Schiff. Chloral, quinine sulphate, and above all potassic iodide, retard digestion. The author would forbid red wine in disturbances of digestion, but would recommend bouillon and dextrin; blood fibrin is also indicated in many cases.—*Medical Press*, January 12, 1887.

THE CURE OF HYDROCELE BY CORROSIVE SUBLIMATE.

Mr. James Miller in a recent number of the *Lancet* recommends the following method in the treatment of hydrocele: The contents

of the sac are to be evacuated, and $\frac{1}{12}$ of a grain of corrosive sublimate dissolved in 15 minims of water (the solution therefore being one grain to the ounce) injected into the sac. This treatment Mr. Miller claims will cause no pain and no return of effusion. The author states that he has employed this method in four cases in which simple tapping had been previously several times followed by the return of the effusion, but that permanent cure resulted after the employment of corrosive sublimate injections.

TREATMENT OF CEREBRAL PNEUMONIA.

HUCHARD advises the following regimen in the case of a child 16 months old:

1. Emetics.
2. Counter-irritants used for three hours at a time.
3. Brandy, in doses of 2½ drachms.
4. Per rectum,

Aquæ, ℥iiss;
Quininæ bisulphat., gr. iiss.

And later in the disease the following:

Aquæ destill., ℥x;
Valerian. pulv.,
Sodii bromid., āā gr. v;
Camphor,
Muscæ, āā gr. iii;
Mucilag. acaciæ, q.s.

THE DIGESTION OF MILK.

M. REICHMANN, of Warsaw, has recently made several experiments on the digestion of milk in the human stomach. The subject was a young man, aged 22, in robust health. The experiments were made by means of the stomach-pump, with unboiled, as well as alkaline and boiled milk. The results were as follows: Three hundred cubic centimetres of unboiled milk are evacuated by a healthy stomach four hours from the time it has been taken, although the regular digestion is completed three hours afterwards. Coagulation of the milk takes place about five minutes after ingestion, and does not depend on increase in the quantity of acid, but on another agency, possibly the fermentation of rennet. During the digestion of three hundred cubic centimetres of milk, the contents of the stomach show the greatest average degree of acidity (thirty-two centimetres per cent.) at the end of an hour and a half. This acidity is owing, when digestion begins, to the presence of lactic and hydrochloric acid; the latter only appears three-quarters of an hour after the ingestion of milk. Half an hour after taking the milk, the quantity of peptones is increased, and remains so for an hour and a half, after which time it becomes perceptibly less. Boiled milk (heated at from 16° to 26° C.) was taken into the stomach; three hundred cubic centimetres were digested in two hours and a half; the acid contents of the stomach disappeared in three hours. After the ingestion of boiled milk, peptonization, which in that case is more energetic, begins sooner, and the clots and caseine are not so thick as when unboiled milk is given. Experiments with alkalized milk have shown that alkalization of milk prevents the peptonizing action of gastric juice. One hundred cubic centimetres of milk, alkalized by means of bicarbonate of sodium, leave the stomach entirely at the end of two hours. Alkalization does not prevent milk in the stomach from coagulating under the influence of rennet. In conclusion, M. Reichmann says that the result of all his experiments on one person entirely coincided with nine previous experiments he had made.—*The British Medical Journal*, February 12, 1887.

TO STOP TOOTHACHE.

GESELL-FELS makes the following mixture, which is an oily liquid, and introduced in the tooth cavity has proved very effective:

Camphor, gr. lxxv;
Chloral hydrati, gr. lxxv;
Cocaini muriat., gr. xv.

PRESCRIPTION FOR HEADACHE.

The following is from DUJARDIN-BEAUMETZ:

Ethoxycafeine, gr. xii;
Sodii salicylat., gr. xv;
Aquæ destill., ad ℥i.
Dose.—Teaspoonful or tablespoonful.

GUIBAUT recommends the following in psoriasis:

Sodii arsen., gr. $\frac{1}{60}$;
Ext. gentian., gr. iss.
In pill form.—Two or three pills after each meal.
Also frictions twice daily with
Adipis, ℥iii;
Acid. pyrogallic., ℥iiss to ℥iv.
Also a thorough cleansing with soap every two days.

—*Les Nouveaux Remèdes*, No. 23.